Strategic Intelligence Classics in their Definitive Microcomputer Versions

CHESS

Version 7.0

BY LARRY ATKIN

ODESTA

The Mind of Man Series
Volume I

Odesta

Odesta develops and publishes intelligent software for microcomputers, specializing in two areas—problem-solving business applications, and programs exploring complex strategy games. Programs are designed to optimize the use of the computer by a non-technical person. One of the distinguishing features of Odesta software is the combination of ease-of-use with extensive user oriented features in each program.

We are located at 930 Pitner, Evanston, Illinois 60202 (U.S.A.), and welcome requests for product information.

A Guide To The Use And Enjoyment Of CHESS

By Larry Atkin

Evanston, Illinois (U.S.A.)

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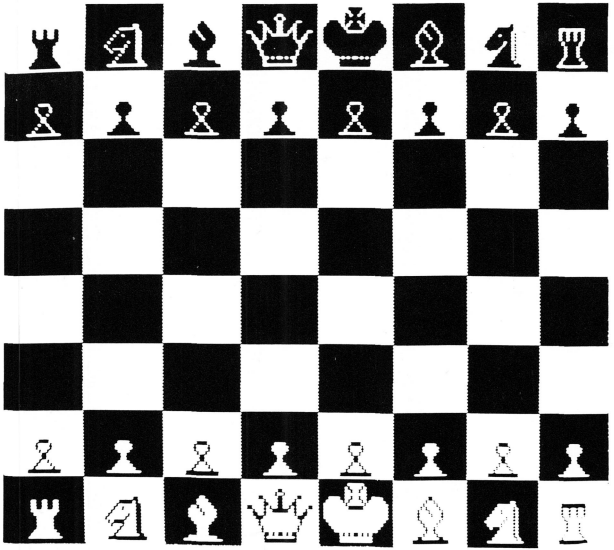
ANATOMY OF CHESS



MAIN MENU

BLIND
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REPLAY/ENACT

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DISK MENU—Allows access to all the disk features.

DEMO DRIVE 1 DELETE GET PUT ←DISK

MESSAGE LINE—Shows checks, mate, LOOK display, prompts, etc.

CHECKMATE

DOCUMENTATION LINE—Shows description of each feature.

START NEW GAME

✓The **CHESS** disk must remain in the drive 1 unit for the duration of the use of the program. The disk will need to be accessed from time to time. Read the entry for **DISK** in the **FEATURES DICTIONARY** for details (and before using any of the disk utilities).

✓Throughout this manual, the symbol ◄► refers to the rotating knob on the game paddle controllers **and** the Arrow keys on the computer keyboard.

The ⦿ symbol refers to the push button on the game paddles, and usually performs the same function as pressing **RETURN** on the keyboard. Therefore, RETURN ⦿ means that if you are using the keyboard, press **RETURN**; and if you are using game paddles press and release the button ⦿.

Some features are only visible when the paddle button is depressed. In these cases, the description of the feature will show ● (press) to activate, and ○ (release) to return to normal.

• These controls (Arrow keys + **RETURN**; game paddle knob + button) control **all** of the features and the moves on the chessboard. See **STEP-BY-STEP**.

✓When the **CHESS** program is first loaded, it will begin running a demonstration routine (**DEMO**). To stop the **DEMO** and begin playing, press RETURN ⦿. There are a few points during this demonstration when your stop command will take 10 to 20 seconds to be noticed (this may occur about two to five minutes into the "show").

✓When it is the **CHESS** program's turn to move, no features can be activated until after **CHESS** has made its move. The list of features will disappear and be replaced by the one word, "**STOP?**". Pressing RETURN ⦿ will stop **CHESS** from continuing to "think" about its move, and the best move found so far will be made. The features will then re-appear, and you will be in full control once again.

✓Features are only visible on the "menu" when they may be used. Various features are dependent on pre-existing conditions before they can be activated. For instance, **BACK** (take back a move) will not be visible until the first move in a game has been made.

✓If you get a **DISK ERROR** message on the message line, make sure that the **CHESS** disk is in place in the drive 1 unit, and press RETURN ⦿. Then just continue with what you were doing. If a **DISK ERROR** message persists, you may need to have your disk drive head cleaned or the drive itself "tuned up."

QUICK START A Flash Guide for the Impatient Experimenter

✓Read THINGS EVERYONE SHOULD KNOW.

✓Consult the brief messages at the bottom of the screen as each option is selected.

←BOARD moves the cursor to the chessboard. ↕OPTION moves the cursor from the board to the menu.

To move a piece, select the piece with the cursor. Press RETURN ⏺. Select a square to move to with the cursor. Press RETURN ⏺. The move will be made and **CHESS** will begin to respond.

Skill levels:

Ø—basic introductory level. **CHESS** moves in under one second.
1—intro. level. **CHESS** averages about 1Ø seconds/move.
2—level 1 + **OPENING LIBRARY.**
3—moderate strength. **CHESS** averages 2Ø–4Ø seconds/move.

For levels 4–8, A–F, P & M, see LEVEL.

REPLAY and RESUME depend on moves that are still "in memory", but have been "taken back" as far as the game on the board is concerned. Experiment and use the prompts on the display, or consult the FEATURES DICTIONARY (or the STEP-BY-STEP GUIDE).

✓RESTART will set-up a new game, and **ERASE ALL PREVIOUS MOVES FROM MEMORY.**

✓Some features are often only available at higher levels of play (3 and up), because of limitations in the search and evaluation process. These are ADVICE, LOOK, and the "sister" feature of LOOK . . . ENACT.

- CHANGE is used to set-up a special position. Certain "legal" conditions must be met before you can exit this mode.

- The disk menu is reached by ←DISK. **WARNING:** the PUT option involves creating a special **"SAVED GAMES"** disk, and has the power to re-format a disk accordingly. Since the disk in question will be completely erased, it is advised that you consult the **DISK** entry in the FEATURES DICTIONARY before entering this domain.

- Much more information is available further along in this manual. The FEATURES DICTIONARY is the definitive reference. The STEP-BY-STEP is a detailed guide to the basic functions needed to enjoy a game (and a few extras).

- For the list of "historic" games and problems stored on your **CHESS** disk, and some background into the game of chess as played by humans and computers, see the APPENDIX.

Bon Voyage!

This section of the manual provides a detailed introduction to the **CHESS** program. Before you have finished, you will know everything you need to play a game and use some of the more play-oriented features. It is assumed that you have read the first part of the manual—THINGS EVERYONE SHOULD KNOW. Feel free to leave the STEP BY STEP at any time and go exploring on your own. You can always re-enter where you left off, or consult the FEATURES DICTIONARY for in-depth information. Now... let's begin.

You have just "booted" your **CHESS** disk in disk drive number 1. After a few seconds, the program will be loaded into the computer.

The program will begin with a demonstration of many features and how they are selected. This DEMO program was designed more as a visual reference than as a true teaching device, so don't expect to throw the manual away. For now, either sit back and watch for a while, or continue reading while the DEMO continues (the DEMO will not stop by itself—it repeats at the end of the sequence).

✓ **Remember:** The **CHESS** disk must remain in the drive unit at all times during the game. The disk will be accessed at various times during your use of the program. If you have only one disk drive, when you use some of the options on the disk menu you will be "prompted" to remove the **CHESS** disk and insert another disk for saving or retrieving games. When this is finished, you will be prompted again to re-insert the **CHESS** disk. Please read the DISK entry in the FEATURES DICTIONARY before using the disk features.

To stop the DEMO, you will have to press either the button on one of the "game paddles", or the **RETURN** key on the computer keyboard.

- If you press the paddle button ◉○, the computer will respond to commands from the controller, **and** you may still use the keyboard at any time.

- If you will be only using the keyboard, press **RETURN.** The computer will now respond **ONLY** to commands from the keyboard.

After making your choice, wait a few seconds. The DEMO will stop, and you will have control over the cursor movements. While looking over the following notes, you can begin your **CHESS** experience by rotating the game paddle knob ↔, or by pressing either of the Arrow keys ↔. These controls are harmless. Nothing will actually be done to anything until you press the paddle button ◉○ or RETURN.

Step-By-Step

IF you are using the keyboard, you will quickly notice that the **LEFT** Arrow ← moves the cursor up the list, and the **RIGHT** Arrow → moves the cursor down (the cursor is the "block" graphic that highlights each word as it passes over it). Since it is the only thing moving on the screen as you push the Arrow keys ←→ at this time, the cursor should be easy to recognize. If you reach the top or bottom of the list, continue to press the same key and see what happens. The cursor will automatically "fold over" to the other end of the list. Therefore, either key may reach any of the features, but the "**LEFT—up, RIGHT—down**" characteristics will be useful to remember for quick access to any feature.

- **CONCISE DEFINITIONS** of the features appear near the bottom of the display as each feature is "selected" by the cursor. Some "prompts" also appear there. Take a look.

- The **REPT** key may be used with the Arrow keys to speed movement at any time. Try it out: hold the Left Arrow key ← down. Now (with the Arrow key still down), press the **REPT** key also. The cursor should scan rapidly up the list, over and over again.

When you first load the program, you are always set to play at level Ø. This is an introductory level, and therefore will not play a strong game. However, even for a strong chess player, it provides a convenient avenue of familiarization with the program. The playing responses are very quick (under 1 second).

MAKE YOUR FIRST CHANGE:

1. Using ←→ (REMEMBER: paddle controller knob—or—Arrow keys), move the cursor to **FLIP** (near the top of the list).
2. With the cursor resting on the **FLIP** position, press the RETURN ◉○ and watch the board.
3. Press RETURN ◉○ several times. Each time RETURN ◉○ is pressed, the white pieces trade places with the black. This gives you a different perspective on the board, which might be useful as you play either the white or black pieces.
4. Press RETURN ◉○ until the white pieces are on the bottom, and the black are on top. You are now back to where you started.

You have just unlocked for yourself a "secret" of this program:

1. Use ←→ to select an option with the cursor.
2. Press RETURN (RETURN ◉○ or sometimes only ◉) to enact that option.

TRY ANOTHER CHANGE:

1. Use ↔ to move the cursor down from FLIP to LEVEL. At this position, the playing strength of the program is adjusted. The levels range from Ø to 8, A to F, P and M.
2. With the cursor resting on LEVEL, press RETURN ⏺ once.
3. You will notice that the cursor moved to the right and became smaller, covering the Ø.
4. Now: use ↔ again. The display will step, one by one, through the entire range of playing levels. Use ↔, and retrace the sequence.
5. When you reach Ø, press RETURN ⏺. You are now back to the original setting, and may use the ↔ to move the cursor away from the LEVEL option.

This type of change is one of several "two step" options, where after you select what you want, you must assign it a value.

- The entry for LEVEL in the FEATURES DICTIONARY will help you decide which level to use.

MAKING A MOVE ON THE BOARD

It is now time to try a move on the chessboard. Check to see if the white pieces are on the lower part of the board, and the LEVEL is set to "Ø". If not, by using the previous two examples, you should set these parameters as outlined.

NOW... move the cursor to ←BOARD. This option is what you must select to gain access to the chess playing board.

Press RETURN ⏺, and the cursor will jump to one of the white pieces on the board.

Use ↔, and watch as the cursor moves around the board.

As you will notice, the cursor does not land on every piece. The cursor will only land on pieces that can legally move from a given position. In this case (the first move), the cursor will land on all the Pawns, and the two Knights. If you are unsure of which pieces are which, consult the section RULES OF THE GAME.

The cursor will also jump to ↕OPTION. In a moment, we will make use of this, but for now, let us continue with the board area.

For the purpose of this example, move the cursor to the Pawn directly in front of the King.

With the cursor in this position, press RETURN ⏺.

You will notice that the "menu" has disappeared. Don't faint! This is merely acknowledging your entry. You are now in the "Move Mode".

NOW... use ↔. You should notice that the cursor moves to each of two squares immediately in front of the Pawn. These two squares represent the legal moves for this piece. Keep using ↔. The cursor will continue to move back and forth.

Position the cursor over the square that is farthest from the Pawn (2 squares in front).

Now... Press RETURN ⏎.

The Pawn begins to flash, both in the original position, and in the new square you have selected for it to move to.

The Pawn has now advanced two squares. You have made your first move. By the time you have read this, **CHESS** will have responded to your move, probably by moving out a Knight. The program's moves are flashed in the same way as yours.

MOVE SUMMARY

- All moves are made in the same way:

1. Select the piece to move with the cursor.
2. Press RETURN ⏎.
3. Use ↔ to scan the possible moves (these may range from 1 to 10 or more, depending on the piece and the position).
4. When you have selected the square to move to with the cursor, press RETURN ⏎ to enter that move.
5. The piece will flash between its square of origin and its destination.
6. At the conclusion of this flashing, the piece will have "moved" to the destination square.
7. The program will now take over, and either make its move immediately, or "think" for awhile and then move.

Let us try one more move before leaving the board for other adventures.

Move the cursor with ↔. You might notice that there are some new pieces added to those the cursor will visit (the Queen, the King and the King's Bishop). Because of your Pawn move, these pieces are now unblocked and meet the requirements for a legal move.

With the cursor, select the Queen.

Press RETURN ⏎. Now use ↔ to see where the Queen may move. There are more possibilities than with the Pawn.

Wait! You've changed your mind! Maybe the Bishop looks like a better move after all.

Move the cursor until it is covering the Queen. Now... press RETURN ⏺.

The board has remain unchanged, and the list of features has returned. It is as though you had never selected the Queen in the first place.

Move the cursor over to the King's Bishop. Press RETURN ⏺. Use ↔ to scan the possible moves for this piece.

Select the square farthest away from the Bishop (on the upper left edge of the board). Keeping your eyes on the board, press RETURN ⏺.

After watching the Bishop flash between its two squares, you may have noticed that your opponent lost no time in capturing your Bishop. So, it wasn't such a great move after all. Everyone makes mistakes, including Grand Masters. With this in mind, the program provides a quick remedy. It's called... **BACK**.

LEAVING THE BOARD

Using ↔, move the cursor around the board until it jumps over to the list at the right of the board. It will highlight the word ↕OPTION. This is the doorway from the board to the list.

Press RETURN ⏺. The cursor will jump up to the first feature above ↕OPTION. You are now on the list, and may use ↔ to move up and down.

Notice that the "doorway" you used to get to the list has changed from ↕OPTION to ←BOARD. This is how it looked when you first began using the program.

Remember: ←BOARD directs the cursor onto the chessboard for moving the pieces. ↕OPTION directs the cursor to leave the chessboard and remain on the section containing the list of features (the "menu").

TAKING BACK A MOVE

Now that you have returned to the "menu", let us continue in our quest to save the white Bishop from a tragic end.

First, find **BACK** on the list (it is just below what is now the ←BOARD option).

Move the cursor so that it covers **BACK**. While watching the area of the playing board where the Bishop was last seen, press RETURN. The black piece will move to its original position and your Bishop will have reappeared.

You have now corrected the results of the "blunder", but the blunder itself is still there. The Bishop can be captured again because it is now black's turn to move. You must continue with the procedure and take-back one more move . . . the Bishop's.

Watch the board again, and press RETURN. The Bishop is now safely in his original position.

You could now return to the board with the ←BOARD option, and continue playing, as though the Bishop never wandered into trouble.

Before you do, however, you might take a look at a few more options.

REPLAY, RESUME, RERUN, and RESTART—
You have succeeded in taking back one "complete" move, i.e., the move for white and the responding move for black.

The move, however, continues to live in the memory of the computer. There are several ways to use this special storage of information.

When the **BACK** option was used, two new options appeared on the list: **REPLAY & RESUME**. We will look at **REPLAY** first.

Move the cursor to **REPLAY**. Watch the chessboard and press RETURN. Press RETURN again. The two moves that were taken back have been replayed, one at a time. This will continue until you have **REPLAY'ed** all moves in memory for the current game.

When you have replayed the final move, **REPLAY** will disappear (because it is no longer useable), and the cursor will jump to the ←BOARD option, making it easy for you to move directly back to the game.

Move the cursor to **BACK**. Press RETURN four times. The board should now look as though no moves were ever made.

Move the cursor to **RESUME**. Watch the playing board and press RETURN. The board has jumped to the most advanced position that was achieved in the game so far.

As with **REPLAY**, this option disappears when it has performed its job, and is no longer useable. A difference here, however, is that the cursor now has magically jumped to the board—so that you can easily continue your game.

For now, let us continue our look at some of these different features. Move the cursor to ↕OPTION, and press RETURN ⏎.

Move the cursor to **RERUN**. Watch the board and press RETURN ⏎. The game will automatically replay to the end of the game, or to wherever you stopped during the game. This command is very versatile. You can stop the **RERUN** at any time by pressing RETURN ⏎. Pressing RETURN ⏎ again will start-up the **RERUN** from the point you stopped.

NOW... if you decide that you do not want to continue with whatever is on the chessboard, the **RESTART** key will erase the game, with all its moves, from the memory. Once you use **RESTART**, the recall options such as **REPLAY**, **RESUME**, and **RERUN** will not be available.

SUMMARY: THE FOUR "R"s

REPLAY: will replay moves one move at a time (up to the most advanced point). This feature may be used instead of **RERUN**, if you want to step through previous plays at your own pace.

RERUN: will automatically replay all moves in their proper sequence.

1. If you take back one or more moves, **RERUN** will replay those moves that have been retracted.
2. If you have not taken back any moves, **RERUN** will always re-enact all of the moves played so far in the game, until stopped by the RETURN ⏎ key.
3. **RERUN** may be stopped at any time by pressing RETURN ⏎.

RESUME: will instantly restore the game to its most advanced point.

1. If you have taken back moves in order to review what has just happened in the game, the **RESUME** option will immediately restore the board to the final position reached before moves were taken back.
2. If you use **RERUN** to re-enact an entire game and decide you do not want to wait through the entire sequence, stop **RERUN** and use **RESUME** to reach the last position played.

RESTART: will set-up the board for a new game. It also completely erases a previous game, or whatever moves have been made, from the computer memory.

✓ **Remember:** If a game or partial game is to be saved, the **DISK** options must be used before **RESTART.**

AUTO, SWITCH, MANUAL, PROGRAM

We will continue our **CHESS** odyssey by first using the **RESTART** option. This will "erase" the few moves entered so far in our "mini game".

Use ↔ to move the cursor to **RESTART.** Press RETURN. The game board is now set-up for a new game.

Move the cursor to **AUTO.** Press RETURN. The program will ask you to set the **LEVEL** for the black side. This feature will allow you to play one level against another. To vary the level for black, use ↔, just as in setting your playing level on the menu. If you do not want to adjust this level, do not use ↔. For now, before continuing make sure the level is set to Ø. Press RETURN.

CHESS is now playing both sides in the chess game. It will continue to do so until: A. RETURN is pressed; or, B. The game is concluded (checkmate or draw).

You may interrupt the game at any time and begin regular play:

- If you are using the keyboard, simply press RETURN and wait for the last move to be completed.
- If you are using the game paddles, the button must be kept depressed until a piece starts to flash, then . Otherwise, your command may not be noticed.

When play has stopped, the menu will return. You may then select the ←BOARD option and move to the game board, from where play can proceed as usual. The program will automatically adjust to play the opposite side in the game.

After watching the computer do all the work for a while, press RETURN (, wait for move,). The program will finish its last move and revert to the "normal" status.

To demonstrate the next feature (**SWITCH**), you must know what side you are now "playing". To do this, move to the ←BOARD option and press RETURN. Use ↔ to move the cursor over the pieces. Whatever color the cursor is moving over is the color to move next—your color. If you enter a move for this color, the program will assume it is playing the other side and will respond accordingly.

Note: The labels directly under the board can also help to see which side is to move. The side labelled **CHESS** is the one that moved last.

Do not make a move now, but instead, remember which side you are now playing, and select the ↕OPTION feature and return to the "menu".

Move the cursor to **SWITCH**. This option will allow you to "switch" sides with the computer, i.e., the program will now make the next move for your side.

Press RETURN ⏎. You should notice that one of the pieces you scanned with the cursor earlier has now been moved for you. The cursor will reappear on the **SWITCH** option at the conclusion of the move. Should you press RETURN ⏎ again, the program will "switch sides" again, making a move for the side it was originally playing.

You may continue to press RETURN ⏎ as many times as you wish, essentially duplicating the **AUTO** function on a step by step basis.

• When playing a "normal" game, the **SWITCH** option is very useful if you find yourself in a losing position, and you would like to see if the computer could take over for you and improve your situation (you could then take over the "better" position occupied formerly by the computer). If you do not want to play the computer's side of the board, you must activate **SWITCH** again.

It is now time to consider the next option on our agenda: **MANUAL**.

Move the cursor to **MANUAL**. Press RETURN ⏎. The cursor will be "thrown" onto the board, to whichever side's turn it is to move. If this feature is used at the beginning of the game, before any moves are made, the cursor will always go to the white pieces. Later in the game, it will depend on which side moved last.

Use ↔ to move the cursor. Select a piece and press RETURN ⏎. Select a square to move to in the usual manner. Press RETURN ⏎.

After your move has been completed, the cursor will jump to the other side of the board.

Use ↔ to move the cursor. As you will see, you are able to select pieces and moves the same as for the other side. If you enter a move here, after the move is completed the cursor will jump back to the other side.

This is what the **MANUAL** feature is all about. **CHESS** makes no moves, but assumes the role of "Record Keeper" and "Umpire".

Use this option if you wish to make moves for both sides in a game, or, if you wish to play a game with a friend. **CHESS** will not only keep track of all your moves (read about **LIST** in the **FEATURES DICTIONARY**), but will also be an "umpire" in the sense that moves will continue to be monitored for their legality. This will prevent errors due to moving a piece to a square to which it cannot legally move; errors in "castling"; recognizing "checks" on a King; etc.

Note: **MANUAL** is also used to enter a game into the computer that is taken from some source such as a book or magazine. Refer to the entry for **MANUAL** in the **FEATURES DICTIONARY**.

• When using the **MANUAL** option, all the other features discussed, such as **BACK, REPLAY, RERUN**, etc., are available as in a "normal" game (playing against the program).

When you activated **MANUAL**, the **SWITCH** option disappeared and **PROGRAM** took its place. **PROGRAM** will achieve the same results as **SWITCH**. The reason for this change in terminology is to keep the function description accurate. When you are playing a game "manually", the **CHESS** program is not strategically involved and **SWITCH** would be meaningless. **PROGRAM**, when selected, simply instructs **CHESS** to make the next move. You will then be out of the manual playing mode. After each use of **PROGRAM**, the word "**SWITCH**" will return to the screen to take its regular place until the **MANUAL** feature is used again.

SUMMARY: AUTO, SWITCH, MANUAL, PROGRAM

AUTO: When selected, **CHESS** will play both sides of the game, switching automatically. To stop the game, press RETURN (or ◉ until a piece starts to flash, then ◎). When the last move has stopped flashing the board will revert to normal.

SWITCH: Instructs the program to change sides and make the next move. With repeated use, the program will play both sides, one move for each time RETURN ◉◎ is pressed.

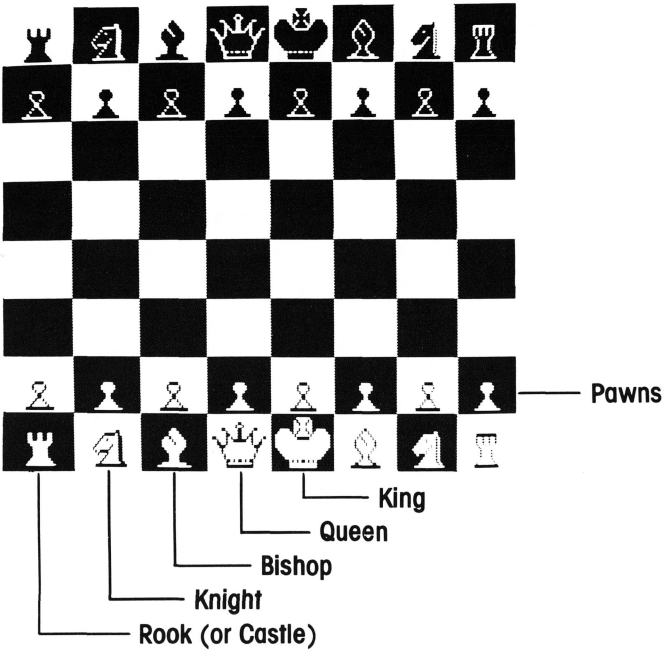
MANUAL: In this mode the program will not make moves for either side, allowing two players to use the video display as the "board". The program will continue, however, to record all the moves, and will not allow any illegal moves.

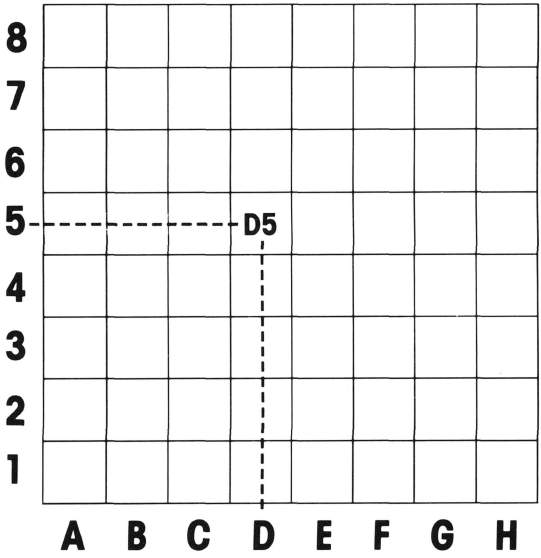
PROGRAM: Instructs **CHESS** to make the next move. **PROGRAM** replaces **SWITCH** when you are using the **MANUAL** feature.

This completes the **STEP-BY-STEP** introduction to **CHESS**.

- Consult the **FEATURES DICTIONARY** for information on any feature.
- **RULES OF THE GAME** section defines some terms and special moves you should know when playing **CHESS**.
- An **INDEX** is included at the end of the manual for locating information that otherwise might be hard to find.
- The **DEMO** program may be started at any time by selecting this option on the disk menu. Running **DEMO** will "reset" the program to the beginning, and any game in the computer's memory will be lost unless saved to disk beforehand.

The CHESS Pieces





The square NOTATION used by CHESS

A glossary of specific rules, terms, and special moves that are used by the **CHESS** program and manual.

• Note: this section does not contain all of the rules of chess, and only defines some terms that will be helpful when reading this manual. The beginning player is encouraged to pursue the matter further in one of the many books on the subject.

CASTLE **An alternate name for the Rook. Also, the name given to a special move for the King and Rook.** This move (castling), allows the King to move **two** squares, either to the right or left. Simultaneously, the Rook on that side (right or left) moves to the first square on the opposite side of the King.

To initiate castling during a game with **CHESS,** select the King with the cursor. Press RETURN (●○). The castling move will be shown as **one** of the possible moves for the King (the King will be able to move **two** squares to either side where castling is currently permitted, in addition to the usual one square move). Select the square with the cursor that represents a two square jump for the King. Press RETURN (●○) to enter this move. The King and Rook will automatically make the correct move.

• You will not be able to select the castling move if it is not "legal" to do so.

There are specific rules concerning when and if castling may take place:

1. There may be no chess pieces between the King and the specific Rook to be castled.

2. Neither piece may have moved at any time prior to castling (even if that piece returns to its original square). Moving the King for any reason will permanently cancel the castling option in that game. If one Rook moves it may not be used to castle, but the other Rook may still be used (until it moves).

3. The King may not castle "out of check". That is, if the King is under direct attack from an enemy piece, castling may not be used to move the King to safety.

4. The King may not castle **into** check, nor may he **cross-over** any square that is being attacked.

YOU MAY: castle to either side of the board. "Queen-side" castling describes the move of the King into the Queen's side of the board. "King-side" castling moves the opposite way.

YOU MAY: castle if the Rook is under attack. The Rook may also cross-over squares that are under attack by an enemy piece (as long as rule 4, above, is not broken).

YOU MAY: castle at any time in the game if the "legal" requirements are met.

Note that "Queen-side" castling involves moving the Rook three squares, while "King-side" castling moves the Rook only two squares.

Rules of the Game

CHECK **This is the term that describes a direct attack on a King.** When a piece is placed on the board so that it attacks the opposing King, the King is "in check". That King must now either be moved or the enemy piece "blocked" or captured. If there is no escape for the King from a check, the game is over. The King has been "checkmated".

There are some special rules concerning "check":

A. A King may never move "into" check. That is, the King may not move onto a square that is under attack by the enemy. Similarly, you may not move a chess piece that will expose your own King to direct attack by an enemy piece.
B. When a King is in check, the check may not be ignored. For example, if your Queen and your King are being attacked at the same time, the first consideration must be given the King even if it means losing the Queen.

When **CHESS** attacks your King and places you in check, it will announce this by displaying the word "CHECK" at the lower left corner of the screen on the message line.

IMPORTANT: The **CHESS** program will not let you select a move that is "illegal". Therefore, if your King is in check, the cursor will only land on pieces that will remedy the check. Also, **CHESS** will not let you move a piece that will expose your King to check. This is a helpful feature, since "checks" are not always obvious to those new to the game.

CHECKMATE **This is the winning term used when the King on the losing side is under attack (in check) and there is no way to escape.** The game is over.

A special characteristic of the game of chess is that the King is never actually captured. If a King is being attacked by one or more enemy pieces and there is no remedy for these attacks (checks), the game ends before the attacking piece(s) actually swoop in for the capture, allowing the King to avoid this "indignity".

CHESS will announce checkmate with an audible signal (a four-beep melody), and the word "CHECKMATE" will appear near the lower left corner of the screen.

DRAW **A "drawn" game is one where neither side is able to conclude the game with a decisive victory (checkmate).** There are several circumstances where a game is automatically declared a draw.

CHESS will declare a draw under the following conditions:

1. **INSUFFICIENT MATING MATERIAL** If neither side has the power to checkmate the other, the program will declare a draw. This will happen if there are **no pawns** on the board and **both** sides contain the following limitations of material.

   A. 1 King, or...
   B. 1 King and 1 Bishop, or...
   C. 1 King and 1 Knight, or...
   D. 1 King and 2 Knights.

Note: it is possible under unusual conditions to mate with only two Knights and the King, but **CHESS** follows the general case in its declaration of a draw.

DRAW (continued)

2. 50 MOVES RULE A draw will be declared if there are 50 consecutive moves by each side (100 plays, total) where:

A. none of them were Pawn moves
B. none were captures
C. none were castles.

3. REPETITION A draw occurs if the same position occurs **three** times in a game, and it is the **same** side to move. The program only scans the last 16 moves for this occurrence, so a draw will only be declared if the repetition happens during these last 16 moves.

The MANUAL playing mode will not declare a game drawn.

• If you play into a draw by mistake, and feel you should be able to win, the last moves can be taken-back. This will give you the opportunity of making different moves from the ones that led to the draw being declared.

CHESS will announce a draw with a four-beep melody, and the word "DRAWN" will appear near the lower left corner of the screen.

EN PASSANT This term describes a special type of capturing move available to the Pawn. The word is French for "in passing", which helps describe the move.

This move is available to Pawns on the fifth rank. From this position the Pawn (Pawn "A") attacks two squares on the sixth rank.

If an opposing Pawn now exercises its option to move two squares on the first move, and this Pawn (Pawn "B") passes over one of the squares being attacked by Pawn "A", then Pawn "A" has the ability to capture Pawn "B", as though it had only moved one square. This is an "en passant" capture.

This privilege is available only on the first move after the advance of the enemy Pawn (Pawn "B" in our example).

If an "en passant" capture is possible, the **CHESS** program will show it as one of the legal moves for that particular Pawn. The cursor will move to the empty square just behind the enemy Pawn that just moved forward. With the cursor on this square, press RETURN ⏎ to enter the move. Your Pawn will now move to this square, and the enemy Pawn will disappear.

FILE This is the name given to the vertical columns of squares (there are eight of them). Each column is a file.

Each file has a letter, A to H. The files are also referred to by the names of the pieces that stand at each end of the file when the game starts.

The names of the files, from left to right are:

A. Queen Rook file.
B. Queen Knight file.
C. Queen Bishop file.
D. Queen file.
E. King file.
F. King Bishop file.
G. King Knight file.
H. King Rook file.

NOTATION **The numbers and letters that label each square on the board are called the notation.** Notation is useful for keeping a record of the game, or when referring to a specific move.

CHESS uses a common type of notation, known as "algebraic notation". In this type of notation, each file is assigned a letter, and each rank is assigned a number. Refer to the notation chart to see how each square on the chessboard is designated.

When a piece is moved, the notation for that move will include the designation for the original square the piece was on, and the designation for the square that was moved to. Thus, if the Pawn on square "B2" moved to square "B4", the listing for that move will read "B2-B4". This is a "move notation".

If a capture takes place, an "X" is placed between the two square notations. So, if the Pawn at B2 captured an enemy Bishop at square A3, the listing will read "B2XA3".

• When **CHESS** is "thinking" about a possible move, the notation that is displayed for the program's move will flash on and off. It may also change as the program considers several different possible moves.

PAWN PROMOTION When a Pawn reaches the eighth rank, it is immediately promoted to a Queen (usually referred to as "queening"). See "**QUEENING**" for more details.

QUEENING **When a Pawn reaches the eighth rank, it is immediately promoted to a Queen.** This privilege is available to all Pawns. It is perfectly possible to have two, three, or more Queens on the board at one time.

The **CHESS** program will automatically change any Pawn reaching its eighth rank into a Queen.

Note: Strictly speaking, the rules of chess do not force you to promote a Pawn to a Queen. You may select any piece except the King. However, the Queen is almost always used.

If you wish to study some particular endgame situation with the Pawn being promoted into a lesser piece, you will have to use the **CHANGE** feature to arrange the board accordingly. The use of **CHANGE** will erase the record of the game up to this point.

RANK **This name is given to the eight rows of squares that stretch horizontally across the board.** When a piece moves forward one square it advances one rank.

The ranks, numbered 1 to 8, are always counted from the perspective of the side being referred to.

This means that the "1st rank" for the white side will be the "8th rank" for the black side.

Looking from white's point of view, its Pawns are on the second rank, and black's Pawns are on the 7th rank. From black's point of view, the numbers are reversed.

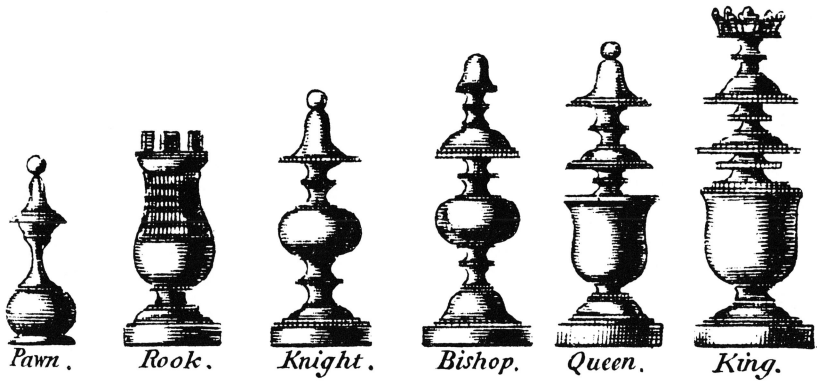
STALEMATE **This is a special type "drawn" ending to a game.** A stalemate occurs when:

A. The side to move is **not** in check, and
B. Any move made by this side will result in the King being placed in check.

In other words, although the King is not under direct attack, all of the possible moves for that side will result in exposing the King to direct attack. Since it is illegal to move the King into check, the side to move has **no** moves and the game is over.

Stalemate may be considered a "blunder" if the winning side (having a significant material advantage and/or a possible mate) allows it to take place.

CHESS will announce a stalemate with a four-beep melody, and the word "**STALEMATE**" will appear near the lower left corner of the screen.



FEATURES DICTIONARY

ADVICE When playing against CHESS, you can get a suggested move.

This feature is not always available. There is no ADVICE at skill level Ø. It will usually be available on the numbered skill levels above 2, and less frequently at other levels. When it is available, it will appear on the menu just below OUTWARD. For more details on availability consult LEVEL.

ADVICE may be activated in two ways:

1. Move the cursor until it rests on ADVICE. While watching the playing board, press RETURN ⦿○. One of the pieces will flash between two squares, as in a normal move. At the conclusion of the flashing, however, the piece will be seen to have not moved after all. This is the move that is recommended. The cursor will automatically jump to the suggested piece, for easy continuation of the game. In addition, the notation for this move will be displayed near the lower left of the screen.

2. For added convenience, the ADVICE option may be selected during a game without moving the cursor off the board. Simply type "A" on the keyboard. The suggested move will immediately be shown, as in (1). The cursor will automatically jump to the suggested piece, but you do not have to make the suggested move. The cursor may be moved to any piece.

This recommended move is derived from two sources. When you are playing in the OPENING LIBRARY, the suggestion will be based on the moves stored in the library (see OPENING LIBRARY).

When "out of the library", the suggestion will be based on the look-ahead search performed by the CHESS program. Since the extent of this "searching" will vary greatly at different levels, the usefulness of the advice given will fluctuate as well. If you rely heavily on these suggestions throughout a game, CHESS will probably maintain an advantage over you.

AUTO instructs the CHESS program to play BOTH sides in the game. AUTO may be activated or stopped at any time in a game.

To activate, select AUTO with the cursor. Press RETURN ⦿○. The menu will disappear, and you will be asked to set the skill level for black. This will give you the opportunity to select a different skill level than that being played by white.

Adjust the level for black with ←→. When the desired level is shown, press RETURN ⦿○. The CHESS program will immediately begin the move (or begin "thinking about" the move), for the side currently to play.

To stop the game:

A. If using the keyboard, press RETURN and wait for the last move to be completed. The menu will then return.
B. If using the game paddles, hold the button down ⦿ until a piece begins to flash. Then release ○. Otherwise, the command may not be "seen".

You are now "out" of the AUTO mode, and may continue the game in the normal fashion.

BACK This command will retract the last move(s) that were played on the board. It is useful for correcting errors or for reviewing the last few moves made in the game.

BACK (continued)

To take back a move, advance the cursor until it rests on **BACK**. While watching the board, press RETURN ⏺. The last move made in the game will be "instantly" retracted. Pressing RETURN ⏺ again will retract an additional move. There is no restriction on the number of times you may use **BACK**. You may take back as many moves as have been made.

Note: When playing a "normal" game (you against the **CHESS** program), the last move made on the board will be that of the **CHESS** program. To correct a poor move by **CHESS's** opponent (human or otherwise), the **CHESS BACK** option must be activated twice.

Special features for the BACK option:

When **BACK** is used, the moves that have been retracted are still retained in the computer's memory. To "reclaim" these moves there are three options available:

A. REPLAY You may replay each retracted move, one by one.
B. RESUME This option will "instantly" reset the board to the most advanced position that was achieved during the game (i.e., the position reached before the **BACK** option was used).
C. RERUN This option can be thought of as an "automatic" **REPLAY**. When you select **RERUN**, each and every move that has been taken back will be replayed one by one, automatically.

✓If you take back a number of moves, and then go directly to the board and make a move, this "new" move is now considered the "last" move in the game so far, and the remaining "un-replayed" moves that were taken back are lost.

Special note: The **LIST** display will help keep track of moves that are taken back. Each retracted move will show-up in "inverse video" (black type on white background) on the listing. See the **LIST** entry for additional information.

BLIND This feature allows the player to experience various types of chess play involving "camouflaged" or invisible chess pieces.

The program keeps track of all the pieces, and the status of either or both sides may be changed at any time.

To enter this mode, select **BLIND** with the cursor. Press RETURN ⏺. The main menu will vanish, to be replaced by a special menu of symbols.

Instead of the regular cursor, a rectangle will surround each combination of symbols. After making your choice using ←→, press RETURN ⏺. The pieces on the board will instantly assume their new identity and the menu will return.

The Knight figure represents the normal chessmen (select the two Knights together for a normal game).

The diamond shapes allow playing with "camouflaged" pieces. All pieces look alike, leaving to the memory the correct designation.

At the positions where only one symbol is shown, the other side will be invisible. The lowest position to which this cursor can move is apparently blank. Selecting this position will make all the pieces invisible, and will closely simulate true "blindfold" play.

BLIND (continued)

When playing with "diamonds", the cursor will move to each piece, as normal. When you are selecting a move for the piece, however, **CHESS** will pretend it does not know the type of piece you are moving. The cursor will scan the possible moves for all the chess pieces added together.

• Since the Queen can move in the same way as any other piece except the Knight, each piece selected, including Pawns, will seem to be able to move to any square as though it had the power of a Queen and Knight combined. It is up to you to remember exactly what piece you are moving and select a legal move accordingly.

Non-legal moves for that piece will not be accepted. A beep will sound and the cursor will return to the piece. Your memory has faltered!

When playing with totally invisible pieces, the cursor will visit each square whether a piece actually occupies it or not. If you select a square that does not contain a piece and then try to make a move, a beep will sound and the "move mode" will not be entered. If a piece does reside there, the possible moves shown will be that of the Queen and Knight combined, and as though no other pieces were on the board blocking the possible moves. Good luck!

Aids in playing: All the features available in a normal game are available here.

1. **ADVICE** will still give a suggestion, either by flashing the piece (if diamonds), or by showing the notation on the message line (if invisible). Remember that **ADVICE** is often only available at skill levels above 2.
2. **INWARD** will show who is attacking any particular square.
3. **OUTWARD** will instantly identify any piece by showing all squares it affects.

✓ **Note:** The status of the pieces is changeable at any time by selecting the **BLIND** option again, and changing the setting. If you get completely lost, change the pieces back to normal and refresh your memory.

• If a game is played (or in progress), in one of the blind modes and is saved to disk, the blind status will be retained when recalled from the disk.

• Changing to and from "blind" play will not otherwise affect the game or listing.

←BOARD This is the option that directs the cursor from the menu to the chessboard, allowing the player to select a chess piece and move it to a particular square.

Move the cursor until it rests on ←BOARD. Press RETURN ⏎. The cursor will jump to a chess piece on the playing board. This piece will always represent the color that is to move next.

Notice that as soon as you activate the ←BOARD option it will disappear, to be replaced by ↕OPTION. As you move the cursor around the chessboard, it will always land on ↕OPTION as part of its route. Selecting ↕OPTION will move the cursor back to the menu section of the display, and ↕OPTION will be replaced once again by ←BOARD.

Think of ←BOARD and ↕OPTION as the "revolving doorway" to and from the chessboard and menu.

CHANGE Using this option, you can create any specific board position.

• If you leave a game in progress to enter the **CHANGE** mode, all memory of the game moves will be erased and a "new" game will be considered to begin from where the **CHANGE** takes place. Therefore, you will not be able to take-back moves beyond this new starting point.

CHANGE (continued)

Move the cursor to CHANGE. Press RETURN ⦿○. After activating the CHANGE option, the menu will vanish and the cursor will jump to the upper right corner of the board. ↔ will move the cursor to each square of the board.

Notice the word "CHANGE" in the upper right corner of the display. This is where you "came in" to this mode, and this is what you must select with the cursor to exit and return to the menu from where normal play may be continued. If certain conditions are not met the CHANGE word will disappear.

• If you are using the keyboard, the REPT key can help to speed-up the process of square selection. While keeping an arrow key depressed, press the REPT key also.

If you have many changes to make and/or you wish to remove "superfluous" pieces, select the CLEAR option. This will "erase" all the pieces from the board with one stroke. Notice that when you use CLEAR, the CHANGE word vanished. To leave the CHANGE mode at this point (the board empty), you must at least place one King of each color on the board (they must be separated by at least one square).

The cursor can also be made to scan over the "color to move next" option. If the words "**WHITE TO MOVE**" are highlighted by the cursor, and RETURN ⦿○ pressed, the instruction will change to "**BLACK TO MOVE**". Each press of RETURN ⦿○ will reverse the instruction. By this method, you may designate the side with the first move from this position.

When the cursor is on a square on the playing board that is to have a new piece, press RETURN ⦿○. This will change the function of ↔ from moving the cursor to selecting a piece.

Using ↔, you can scan through all the possible pieces to be placed on this square. When the desired piece is visible, press RETURN ⦿○. The piece will be placed on that square, and the cursor may be moved again using ↔.

✓The **CHESS** program continuously monitors the board for various "legal" constraints. Therefore:

1. You will not be allowed to place a Pawn on the 1st or 8th rank (a Pawn on its 8th rank would automatically become a Queen, and a Pawn on the first rank is simply impossible).
2. No more than 32 pieces, total, may be placed on the board. Strictly speaking, there should never be more than 16 pieces of either color, but **CHESS** is more lenient in this regard.

This "legal" monitoring is provided to help prevent mistakes when setting-up some complex position. Another aspect of this overseeing function is that:

YOU CANNOT LEAVE THE "CHANGE" MODE if certain conditions are not met:

1. There must be **one** black King and **one** white King.
2. If a King is in check, it must be **that** King's turn to move. Another variation on this theme is: both Kings may not be in check at the same time.

If these requirements are not met, the CHANGE option which should appear at the upper right of the display will not be present, and you will not have entry back to the menu from where you could continue to play.

• If the FLIP option was used before entering the CHANGE mode, the board will remain "inverted".

Features Dictionary

CURSOR This term refers to the visual "pointer" that you control with the Arrow keys or game paddle knob. The cursor may take various shapes, depending on what it is "pointing to".

The cursor is the means by which you can select among the options, and it is used to select the game pieces that you wish to move (as well as the square the piece will move to).

The cursor will not initiate any change in the operation of the program. It only shows what may be changed. The change or feature will only be initiated when RETURN ⏎ is pressed.

DELETE This is a special option that allows you to "erase" a game you have stored on your "Saved Games" disk.

See the ←DISK entry for full details.

DEMO This is the special demonstration program that begins running when you first load in CHESS.

As a selectable feature, it is found on the disk menu.

✓Running **DEMO** will "reset" all the **CHESS** features to their original state, and a game in memory will be erased.

To run the **DEMO** without re-booting the disk, you must first enter the disk menu (←DISK). From this menu, select **DEMO** with the cursor. Press RETURN ⏎. The demonstration program will now begin.

To stop the **DEMO**, press RETURN ⏎. As soon as the program finishes the current "routine", the demonstration will stop and you will return to the regular playing mode.

- If the program is demonstrating the **CHANGE** mode, you may have to wait for up to 30 seconds for your stop command to be acknowledged.
- The **DEMO** "movie" will graphically portray most of the features and procedures. Special messages will appear at the bottom of the screen, explaining what is taking place. Two "beeps" will sound when a new feature is being activated.
- The full "demonstration" will run for about 10 minutes before automatically restarting (it will run "forever", unless it is stopped).

←DISK This is the "doorway" to the disk menu.

When selected, you have the option of selecting between four functions and changing one parameter.

✓To leave the disk menu, select ∧**OPTION** and press RETURN ⏎. You will then be "prompted" to insert the **CHESS** disk. If the **CHESS** disk is in its proper place (drive 1 disk unit), press RETURN ⏎.

The options selectable on the disk menu are:

GET—retrieve a game from the disk.
PUT—save (store) a game to a disk.
DELETE—erase a game from the disk.
DRIVE 1—select the disk drive unit that will hold the "**SAVED GAMES**" disk.
DEMO—play the **CHESS** demonstration program.

All of the warnings in this manual concerning the disk functions center around the **FORMAT** option that will appear when you try to save a game (**PUT**), to a disk that has not yet been "prepared".

←DISK (continued)

The "SAVED GAMES" disk is a special diskette that has been "set-up" according to the needs of the **CHESS** program. The **FORMAT** option will do this automatically. You cannot save games on the **CHESS** disk.

✓**The diskette to be used for the "SAVED GAMES" disk will be erased as part of the procedure. Therefore, DO NOT USE A DISKETTE CONTAINING IMPORTANT INFORMATION FOR THIS PURPOSE.**

Select a blank diskette, or one that is expendable, to be used for the "SAVED GAMES" disk and continue reading.

DRIVE _____

When **CHESS** is first loaded into the computer, this option will always read "**DRIVE 1**". If you have **one** disk drive, leave the option as it stands. If you have **two** disk drives, move the cursor to **DRIVE 1** and press RETURN ⓞ. The number to the right of "**DRIVE**" will change to "2". This will instruct the program to access the 2nd drive unit when attempting to save a game, or when looking for a game to retrieve from the disk. Each press of RETURN ⓞ will change the number again.

• If you are using only one disk drive, the program will prompt you to remove and insert the **CHESS** program disk and the "**SAVED GAMES**" disk. You do not have to replace the **CHESS** disk in the drive unit until you are ready to leave the disk menu and select ^**OPTION**.

PUT _____

This feature will "save" your game or partial game to a diskette. To use, insert a "**SAVED GAMES**" disk (or any disk you wish to use), into the disk drive selected by the **DRIVE** option. Press RETURN ⓞ.

If this is the first time the disk is used for this purpose, the program will respond with "**NOT A CHESS SAVED GAME DISK**" and "**FORMAT**". If you press RETURN ⓞ at this point, the disk will be erased and formatted specifically as a "**SAVED GAMES**" disk.

✓If you decide not to format the disk after all, use ←→ to move the cursor from **FORMAT** to **PUT**. Refer to the message at the bottom of the display to verify your selection. Then press RETURN ⓞ.

If you continue with the **FORMAT** operation, the disk drive will whir as this feat is accomplished. Once this operation has finished, you may proceed and "save" a game to this disk.

With a formatted "**SAVED GAMES**" disk, you will have a "text page" before you that will receive your special name for each game.

✓*Names may contain up to 15 characters.* Special characters, such as those obtained with the control (**CTRL**) key, are not allowed. **THE FIRST CHARACTER MAY NOT BE BLANK.**

• You may save up to 40 games per disk.

An elongated cursor will scan each of these 40 "slots" when you use ←→. To enter a name, simply begin to type on the keyboard. The cursor will disappear to be replaced by whatever you type. When finished with the "name", press RETURN ⓞ. The game will be saved on the disk along with the name you have just entered.

✓If you decide against saving a game once you have entered this mode, do not begin typing a name. Instead, move the cursor to "**PUT**" and press RETURN ⓞ. If a name has been started, use the left Arrow key ← to back-up to the beginning and press RETURN ⓞ.

←DISK (continued)

GET _____

By selecting this option, you may retrieve a game from a "SAVED GAMES" disk, or one of the special games from the **CHESS** disk. Disk drive number 1 must be selected to retrieve the games from the **CHESS** disk.

To use GET: Set the drive number as appropriate for your system and the disk you wish to access. Move the cursor to **GET**. Press RETURN ⏎. You will now see the "catalog" of either your "SAVED GAMES" disk, or the catalog of special games that have been saved on the **CHESS** disk.

Move the cursor until it covers the game that you want to "retrieve". Press RETURN ⏎. The selected game will be loaded into the computer, and you will return from the catalog listing to the disk menu.

✓If you decide against "getting" a game once you are in this mode, move the cursor to **GET** and press RETURN ⏎. You will exit without doing anything.

- If the disk has not been specially formatted, the message "NOT A CHESS SAVED GAMES DISK" will appear near the bottom of the screen, and the cursor will remain on the disk menu.
- See the **APPENDIX** for a list of the games stored on the **CHESS** disk.

DELETE _____

Use this option to erase any game you have recorded on the "SAVED GAMES" disk.

To use, check that the **DRIVE** option is set correctly. Select **DELETE** with the cursor. Press RETURN ⏎. The catalog of saved games will appear.

Move the cursor with ←→ until it highlights the game you wish to delete. Press RETURN ⏎. The game will be erased, and you then will be returned to the disk menu.

✓If you decide not to delete a game after you have entered the mode, move the cursor to **DELETE** and press RETURN ⏎. You will exit this mode without changing anything.

- If the disk accessed is not a formatted "SAVED GAMES" disk, the message "NOT A CHESS SAVED GAMES DISK" will appear near the bottom of the screen.

DEMO _____

This is not a disk utility. The **DEMO** program is what is running when you first load in your **CHESS** disk. Refer to the entry for **DEMO** for more details.

ENACT is a feature designed expressly to aid you in your consideration of the predicted move(s) that are displayed by use of the LOOK feature.

ENACT shares the same location on the menu as **REPLAY**, and will only be visible on the menu when **LOOK** is useable (i.e., visible). For the meaning of the **LOOK** display, consult the entry for **LOOK**.

The purpose of this feature is to display on the playing board, one by one, the move(s) shown as "move co-ordinates" by the **LOOK** feature.

To use enact: Move the cursor to **ENACT** (located just below **BACK**). While watching the board, press RETURN ⏎. The first (or only), move shown in the **LOOK** display will have taken place on the chessboard. The playing piece will have moved "instantaneously", without the flashing that characterizes a move

ENACT (continued)

in other modes. The LOOK display will now appear near the lower left corner of the screen. If there are more moves listed in the display, each press of RETURN ⏎ will "ENACT" one more move.

Notice that as each move is "enacted", the ENACT display will remove the white background from the co-ordinates for that move. This is your instant reference as to which moves have been "enacted" and which moves remain in the look-ahead list.

When the **last** move on the display has been "enacted", the cursor will automatically jump to RESUME. Pressing RETURN ⏎ will now restore the board to the position existing before the ENACT feature was used. This is a quick way of returning the board (and the game) to its "pre-ENACT" state.

The game may now be continued in the normal way. If you do not activate the RESUME option when it is offered to you, the board will not be reset, and you can continue play from this "new" position by moving the cursor to the board.

- This visual display is very useful for those who would find it difficult to project the numbers of the LOOK display onto the board as actual moves. As the number of moves increases so does the value of ENACT.

FLIP The purpose of this feature is to change the perspective of the board by turning it 180 degrees.

This will reverse the relative top-to-bottom positions of the white and black pieces. The reasoning behind the feature derives from the fact that when playing chess on a physical board, the player using the black pieces views the board differently than the "white" player.

Although the vertical board of the video screen gives a "bird's-eye" view that is somewhat different from usual play, the FLIP option can simulate the natural change of perspective, and can be valuable for keeping "in practice" with this aspect of the game.

Note: When "flipped", the square notation will "flip" also, as though inscribed on the board. This will not affect move entry, which will proceed as usual, but the move numbers displayed at the bottom of the board, and the LOOK notation, might become confusing. Refer to the square notation chart at the front of the manual (turn it to correspond to the current position of the board).

- When saved to disk, the board will be saved in whatever position (flipped or un-flipped) it last was when saved.

FORMAT This is one of the functions of the DISK utilities, and will be offered as an option when PUT is selected if the disk used has not already been formatted for use with the **CHESS** program.

The FORMAT option WILL ERASE THE CONTENTS OF ANY WRITEABLE DISKETTE that is inserted in the selected disk drive, and prepare it for saving games played with the CHESS program.

Please read the entry for ←DISK before using this option.

GET This option is selected to retrieve games that have been saved to disk.

You may "get" games from either the "Saved Games" disk that you have created, or you may select one of the special games from the **CHESS** disk.

See the ←DISK entry for full details.

INWARD **This is a special feature that will show what chess pieces are affecting (attacking or defending) any specific square.**

INWARD may be selected on the menu by the cursor in the usual way, or may be selected during a game without having to move the cursor from the game board.

When using the menu, select this option with the cursor. Press RETURN. The cursor will jump to square H-8 (the upper right corner, unless the board has been "flipped"). The cursor may now be moved around the board using ←→.

When you have chosen a square to be investigated, press RETURN. Any pieces that are attacking or defending that square will show a "union jack" type figure superimposed over the piece. Press RETURN once more to "free" the cursor so it may be moved.

Note: The word "**INWARD**" is your exit from this mode. Move the cursor to this word and use RETURN to return to the menu (and normal play).

From the board: When you are playing a game, the **INWARD** feature is available without having to move the cursor to the menu. Simply type the letter "I". This will implement the feature just as though you had selected it from the menu with the cursor. After typing "I", use ←→ to move the cursor around the board. Press RETURN to look at a specific square, the same as described above. To leave this option and return to normal play, simply press the "I" again.

- For the beginning chess player, **INWARD** can be used to discover ill-advised moves before they are made, by letting the player know what enemy pieces are attacking a square to which a move is being considered.
- **INWARD** is also useful during play in one of the **BLIND** variations as a means of verifying that you still remember what is what.

LEVEL **This option allows you to adjust the playing strength of the CHESS program.**

To adjust the skill level, move the cursor to **LEVEL**. Press RETURN. The cursor will now highlight the number or letter to the right of the option. Use ←→ to scan through the range of levels available. When the desired level is reached, press RETURN. The selected level will be entered, and the cursor will move back to the **LEVEL** option.

Note: The manner in which **CHESS** finds its move does not always allow for the generation of the information needed for the **LOOK**, **ADVICE** and **VALUE** features. The availability of these features also depends on the level chosen. The explanations of the various levels will contain an indication of the useability of these features.

LEVEL (continued)

THE CHESS SKILL LEVELS

LEVEL	Approx. Average Time Per Move	Approx. Average Search Depth (ply)
Introductory levels		
Ø	1 sec.	Ø
1	1Ø sec.	Ø-1
2	1Ø sec.	Ø-1 (OPENING LIBRARY)
Time limited levels		
3	2Ø-4Ø sec.	1-3
4	4Ø-8Ø sec.	2-4
5	1-3 min.	2-5
6	2-6 min.	3-6
7	4-12 min.	3-7
8	8-24 min.	4-8
Depth limited levels		
A	5-4Ø sec.	1-3
B	2Ø-2ØØ sec.	2-4
C	1-1Ø min.	3-5
D	5-3Ø min.	4-6
E	1-4 hrs.	5-7
F	5-2Ø hrs.	6-8
"Perpetual" Mode		
P	—	23
Mate-finder Mode		
M	—	22

- The times listed for each level are only very general approximations, and can vary widely from move to move and from game to game.

LEVEL Ø: This is the basic introductory level. It performs an "instantaneous" evaluation of the **CHESS** pieces, and makes a move. It will teach the beginner about "blunders", and not much else. It is particularly weak in the endgame. At level Ø, these options are not available: **ADVICE**, **LOOK**, and **VALUE**.

LEVEL 1 has a little time to search a move, but not much. It often will not complete a 1-ply search. The endgame is much stronger than level Ø. If the move search cuts-off before a certain point, these options will not be available: **ADVICE** and **LOOK**.

LEVEL 2 is identical with level 1, except that the **OPENING LIBRARY** has been added, giving the player access to top opening lines of play, while still using a quick playing level.

- All the levels above 1 use the **OPENING LIBRARY** (except "M").

LEVELS 3, 4, 5, 6, 7, & 8

The numbered levels are designed with emphasis on regulating the "thinking" time of **CHESS**. The time used for each move will be fairly consistent. This means that **CHESS** may often be forced to make a move before it has finished its full evaluation (especially at levels above 4). However, as the total number of pieces in the game is reduced, the searching process becomes quicker, resulting in a more extensive evaluation in the same amount of time. Levels 3-6 fall into the general range of a "normal" game, with levels 7 and 8 best used for the evaluation of specific positions.

- The numbered levels are designed so that the **LOOK**, **ADVICE**, and **VALUE** features are available more than 9Ø% of the time.

LEVEL (continued)

LEVELS A, B, C, D, E, & F
The lettered levels allow **CHESS** to take as much time as is necessary to reach the minimum ply search depth selected by you. The amount of time required to complete a search to a specific depth depends on many factors, including the number and type of pieces on the board, and their relative positions. As a result, a 4-ply search can take 45 seconds or 45 minutes to finish.

In the endgame (where there are fewer "strong" pieces on the board), the evaluation time will generally be shorter than earlier in the game, resulting in quicker play by **CHESS.** For a stronger endgame, go to a higher level at this point.

• Certain aspects of the search and evaluation procedures have been optimized in the lettered levels. The trade-off for this improvement is that the LOOK and ADVICE features will be available only about 30–50% of the time. Explore both numbered and lettered levels for more variety in the program's play.

✓Special note: **CHESS** thinks about its next move while you are thinking about yours. If you play as "predicted" by the program, the response to your move will be quicker (depending on the amount of time you take to move).

TO ANALYZE A POSITION

• **From any point in a regular game** that you are playing or have retrieved from a disk, select SWITCH.

• **From the** MANUAL mode select PROGRAM.

• **From the** CHANGE mode select the correct side to move. Return to the menu and select SWITCH.

The **CHESS** program will then take over and begin considering the position. If you tire of waiting, you can stop the evaluation with RETURN ⏎. **CHESS** will make the best move found so far and the LOOK display (if available), will still give the predicted moves that seem the strongest at this time.

Mating problems, in particular, may be analyzed. There is a special level "M" for certain types of mate problems, but the levels 6–8 (and D–F) will find the answer much more quickly if the mate involves a series of checks, captures, or forced moves. In these situations **CHESS** may find the correct moves in much less than "average" time.

LEVEL P is a special mode that has been designed to search a particular position until told to stop. It is ideal for "postal" chess tournaments (a game conducted move by move, by mail). When level "P" is selected it will consider any move to a depth of 23-ply unless stopped. This could take practically forever, hence its label as a "perpetual" mode. You can let it "think" for as long as you want, then stop it to see the move (and possibly the LOOK display).

LEVEL M is also more of a specialized operating mode than a level. Level "M" has been specifically designed to solve complex "mating" problems. It can solve **any** problem or situation in which a mate in 11 moves or less (22-ply), exists. If there is no "mate in 11" or less, this will be announced eventually.

If level "M" finds a mate, the correct first move will be made and the program will announce **"MATE IN 8",** or whatever is accurate after the first move. You may now make a move on the board (any move). **CHESS** will then enter the "mate-finder" mode again and eventually come up with the **next** move. You will find that this can take enormous amounts of time.

LEVEL (continued)

- This is the only level that will consider certain mating problems such as the limitation of two Knights and a King against the same (or less) material. All other levels will consider this a draw. (See **DRAW** in **RULES OF THE GAME**).

- If the "mate" consists of a series of checks, you might be better off selecting one of the regular evaluation levels (7–8, E–F), depending on the number of moves involved (even levels 6 and D can find many mates in 3).

LIST Selecting this feature will allow you to see the game record for the game you are playing, or have just finished.

To access the listing select **LIST** with the cursor. Press RETURN. The last 40 moves will be in view. To return to the menu again, press RETURN.

The moves are recorded in the proper sequence using algebraic notation. The notation chart in the front of the manual will allow identification of each square with the same alpha-numeric "name" that is used in the listing.

Only 40 "complete" moves are displayed at any one time (40 moves for white, + 40 moves for black). Any other moves that may have been made are not "lost", but may be seen by using some of the other features such as:

RERUN: the listing will "follow" the game on the board. If at the end of the game you have played 60 moves, only the last 40 will be visible on the listing. When **RERUN** is activated the listing will reset to show the **first** 40 moves, and will increment forward as needed.

BACK: this is a much more tedious method of moving the list back. After having taken-back the last 20 moves of the game, the list will then begin to scroll back.

WHEN MOVES ARE RETRACTED: LIST will show this by highlighting each move that has been taken-back. This is especially helpful when you are re-playing a previous game, and want to look at a particular move. This "highlighting" will affect one move at a time when using **BACK**, or will cover the entire game when **RERUN** is used. During **RERUN**, as each side moves, the notation for that move will return to normal. By this means you can always tell what move number you are on (stop the **RERUN** and take a look at the list. **RERUN** may be restarted again and again).

✓ **Note:** When you use features such as **RESTART** and **CHANGE** the listing (and all other traces of your game) will disappear, never to be seen again unless the game has been saved to disk beforehand.

- When you save a game to disk, the entire **LIST** is saved along with it.

- There is a maximum of 255 moves for any one game.

LOOK When used during a game, this feature shows what CHESS expects will happen in future moves. The **PRINCIPLE VARIATION** as found in the look-ahead search will be displayed near the lower left side of the screen.

This feature is not always available. It is never available at skill level 0. **LOOK** will appear most frequently when using the **numbered** skill levels above level 2. When it **is** available, it will appear between **OUTWARD** and ←**BOARD** on the menu. For more details about this aspect of **LOOK**, consult the entry for **LEVEL**.

LOOK (continued)

To **activate** LOOK, move the cursor until it rests on LOOK. Press RETURN (●○). The LOOK information will appear as square co-ordinates (in "inverse" video), on the message line. Move the cursor, and continue with the game, or any other feature. In particular, try ENACT. This feature will help in the use of the LOOK display.

The LOOK display will consist of one pair (or a series of pairs), of square co-ordinates, representing the best move(s) CHESS has found.

The first co-ordinates represent the best move the program thinks you could make (CHESS has just moved). Additional moves listed (if any), will indicate a "best" response by the program to the move that is projected for you, another counter-response by you, etc. The maximum display is seven move coordinates, which will represent seven ply of "search". There are times at the higher levels when the search depth may extend to greater than seven-ply. The display, however, will show only the top seven.

Each side's move represents one "ply" of "search". Skill level 3 is considered a "two-ply" search level. Therefore, at this level usually only one move (your predicted response to the program's move), will be listed on the display. This may vary depending on the specific board position. In the endgame for instance, deeper searches may be performed, resulting in more moves being shown.

Note: The accuracy of the LOOK "prediction" has limitations. Each progressive move notation (left to right), in the display represents one less "ply" of search. Therefore, the last entry is based on much less information than those preceding it.

- If you move as "predicted" the following move by the program will often be much quicker, as it has accomplished much of the searching already. Of course, if you do **not** respond as **CHESS** predicts you will the entire sequence is meaningless as far as the evaluation of the next move by the **CHESS** is concerned.

MANUAL ***In this mode, the program will not make a move for either side, allowing two players to play a game between themselves.***

Select MANUAL with the cursor. Press RETURN (●○). The cursor will jump to the board. The side the cursor selects will always be the side that is to move next (at the start of the game the cursor will always move to the "white" side).

After a move has been entered for one side, the cursor will automatically jump to the other side and play should continue in the usual way.

TO RETURN TO REGULAR PLAY, select PROGRAM. This will instruct **CHESS** to make the next move. You then have the option, after **CHESS** moves, to continue the game manually (select MANUAL again) or to begin play against the program (move the cursor to the board and begin normal play).

Since the program is not analyzing any moves in this mode, the LOOK, ADVICE, and VALUE options will not be available. All of the other features will function normally. This includes the full listing of the game and the disk utilities for saving the game.

✓**Note:** While in the MANUAL mode, the program continues to monitor the board for legal moves. You will not be allowed to move into check, or to "castle", etc., if the pieces do not meet the requirements. Checks, mates, and stalemates will be announced. **"DRAWS" will not be announced.**

MANUAL (continued)

If the cursor does not move to a piece it is because you cannot legally move that piece. Because of this "monitoring" feature, **CHESS** performs the role of a play by play umpire in games between two humans. All decisions are final.

• MANUAL is particularly useful for replaying, studying, and saving games that are to be found in various books and magazines.

To "enter" a game into the computer, first look at each move notation as listed in the book and then make the corresponding move on the board. The cursor will always jump to the correct side to move next.

Once you have entered the entire game in this fashion you may save the game to disk, and it may be recalled along with its full LIST at any time. You may also study the game with any of the options normally available in the **MANUAL** playing mode.

✓If you wish to save the game you are advised to do so **before** using other options, to protect against mishaps.

MENU This is the term that refers to the list of selectable options and features. These options may be thought of as "on the menu".

The **CHESS** program has two primary menus:

1. the game features menu (main menu)
2. the disk menu

To get from the playing board to the main menu, select ↕OPTION with the cursor, and then press RETURN ⏎.

To get from the main menu to the disk menu, select ←DISK with the cursor and then press RETURN ⏎.

OPENING LIBRARY This is not a selectable feature, but it is a feature of the **CHESS** program, nonetheless.

The "opening library" refers to the storage of a series of moves and counter moves that are known to provide strong play during the "opening" moves of the game.

• The **CHESS** program as about 7,ØØØ of these moves stored in the program.

When playing a game at skill level Ø or 1 this opening library is not used, and the opening moves are weaker. All of the other levels except for "M" make use of the library.

When you make your first move the program will scan the "library" to see if your move is in it. If it is, then the program selects from one or more different responses to the move. This process usually takes about one second (or up to 1Ø seconds).

If the move you make is **not** in the library, the program will have to ponder your move in the usual manner and will take considerably longer in selecting a move.

• There are some lines of opening play where the program may draw from the library as many as 16 moves before having to evaluate the position.

SPECIAL NOTE: As long as the program is still able to use the opening library, the ADVICE feature will suggest a move from the library. Otherwise, the suggestion will be based on the look ahead search. See ADVICE.

↕OPTION This directs the cursor to move from the chessboard to the menu, allowing the player access to the variety of features listed there.

↕OPTION (continued)

The ↕OPTION directive will always be one of the places the cursor will jump to when scanning the pieces that may be moved on the board.

See ←BOARD.

---

^ OPTION This directs the cursor to move from the disk menu to the main menu. It is only visible after you have entered the disk menu (←DISK).

When you select ^OPTION and the Drive assignment is set at "**1**", a message will appear that will "prompt" you to insert the **CHESS** disk into disk drive number 1. If the disk is in place, press RETURN ⏎. The cursor will jump up to the main menu.

OUTWARD Will show which squares and pieces are affected (attacked or defended), by any specific piece.

The selection of **OUTWARD** may be made from the menu in the normal fashion, or may be initiated during a game without moving the cursor from the board.

From the menu: select **OUTWARD** with the cursor and press RETURN ⏎. The cursor will jump to one of your pieces (or a piece of the player whose turn it is to move).

Using ←→ to move the cursor, select the piece you wish to investigate. Press RETURN ⏎. The **OUTWARD** display will now be visible as a "union jack" type of symbol in each square, and superimposed over every piece that your selected piece affects. Notice that there is no discrimination between friendly pieces and enemy pieces. To "free" the cursor to move again, press RETURN ⏎.

To return to the normal playing mode, move the cursor to **OUTWARD** at the right of the board and press RETURN ⏎.

From the board: When you are playing a game, the **OUTWARD** feature may be conveniently accessed without moving the cursor from the chessboard. Simply type the letter "O" on the keyboard. This will put you in the **OUTWARD** mode, the same as selecting the option from the menu. After pressing the "O" key, move the cursor with ←→ as before, and press RETURN ⏎ to view the **OUTWARD** display for any selected piece. Press RETURN ⏎ again to "dissengage" from that piece and move to another. Press the "O" key a second time to exit from this mode.

- This feature is useful to the beginning chess player who may not always remember how a particular piece may move, or how it attacks.

- **OUTWARD** also takes on a very special significance to the player venturing into the **BLIND** mode. With this feature any piece in question may be instantly identified without revealing the identity of any other piece.

PLY This is a term that comes up occasionally when some of the features are being explained. It is used to indicate the extent of the "search" performed by the **CHESS** program for each move.

A 1-ply search means the examination of each possible move by the **CHESS** program, and the evaluation of each resulting position. **CHESS** can then judge the resulting scores and arrive at a "best move". A 1-ply search is the minimum needed to protect against many types of "obvious" blunders.

A 2-ply search implies that **CHESS** will, in addition, consider every possible reply by the opponent to every possible move by **CHESS**. The resulting positions are then evaluated and scored.

PLY (continued)

For a treatment of the entire subject of how computers manage to play the game of chess, see the **APPENDIX.**

PRINCIPLE VARIATION This is the name given to a sequence of moves considered best for both sides, and represents the primary reference that the program uses when selecting its move.

The principle variation is generated during the look-ahead search performed by the **CHESS** program and is used in features such as **LOOK** (which displays the principle variation) and **ADVICE**, which will suggest a move based on this same information.

PROGRAM When playing in the MANUAL mode, selecting this will instruct CHESS to make the next move, and gives you the opportunity to resume normal play (against CHESS). **PROGRAM** is only visible after **MANUAL** has been activated and it replaces **SWITCH** on the menu (just above **AUTO**). See the entry for **MANUAL.**

To use, move the cursor to **PROGRAM.** Press RETURN ⏎. **CHESS** will immediately take-over the next move. When the move has been completed, **PROGRAM** will have vanished from the menu, to be replaced by **SWITCH.** This indicates that you are no longer in the **MANUAL** mode.

You now have the choice of either:

1. Moving the cursor to the board, and continuing the game against the **CHESS** program, or . . .
2. Selecting **MANUAL** again, to continue playing the game with a friend.

PUT This option is selected to save a game to a diskette. The game may be one you have just played or one that has been "loaded" into the computer by means of the **MANUAL** mode.

- A partial game may be saved and retrieved later to finish playing.

✓Please read the ←DISK entry before using this option.

QUIT Use to leave the CHESS program. This option will automatically "boot" another disk that is placed in the disk drive **BEFORE** you activate **QUIT.**

To use: select **QUIT** with the cursor. Press RETURN ⏎. The message "Insert system disk and type Q" will appear. Place another program diskette in the drive-1 unit. Type "Q". The **CHESS** program will then disappear, and the drive-1 disk unit will be activated, loading into the computer whatever program is on that particular diskette. If you change your mind about QUITTING, press RETURN ⏎ instead of "Q" with the **CHESS** disk in place.

REPLAY This feature will show a replay of a move that has been taken back.

This option will only appear after **BACK** has been used or if **RERUN** is initiated and then stopped before reaching the end of the moves stored in memory for that particular game. When useable, **REPLAY** will appear just below **BACK** on the menu.

To use, advance the cursor to **REPLAY.** Press RETURN ⏎. The move that was originally made here during regular play (and then taken back), will be shown moving in the same manner as in a game.

If there are more moves available for recall, continue pressing RETURN ⏎ for each move you want replayed. After the final move **REPLAY** will disappear and the cursor will appear on **ENACT** or move to the ←BOARD option.

RERUN **This feature will automatically replay all of the moves in a game.**

It may be used at any time during the course of a game to replay the moves made thus far. The moves will be made by flashing the pieces in the normal manner. You can always tell what move number you are on by stopping RERUN and consulting the game listing. See LIST.

To start the RERUN, select the option with the cursor. Press RETURN. The process will begin immediately.

RERUN may be stopped at any time by pressing RETURN. The menu will return, signifying the return to the normal playing mode. You can enter the game at this point and begin play.

- RERUN may be activated at the end of a game and it will replay the entire game.
- RERUN may be activated during a game still in progress, and it will replay all moves made up to that point.
- RERUN may be activated after BACK has been used one or more times, and it will replay the moves that have been taken back.

RESTART **This feature is used to set-up the board for a new game. It may be used at any time.**

✓**Note:** The use of RESTART will "erase" the memory in the computer of your previous game (or partial game). The listing will disappear and there will be no RERUN option available. The game is gone.

✓**IF YOU WISH TO SAVE YOUR GAME** to disk, do so **before** using the RESTART option.

To use, select RESTART with the cursor. Press RETURN.

RESUME **restores the game to its most advanced point.**

It may be used:

A. after BACK is used,
B. if RERUN is stopped before reaching the final move in a game,
or
C. after using ENACT.

RESUME is only available when one of these other features is in use. When available, it will appear near the bottom of the menu just above RESTART.

To use, select RESUME with the cursor. Press RETURN. The board will immediately jump to the most advanced point and the cursor will appear on the board.

- When using RERUN, if you decide you do not want to wait for the RERUN to step through the entire game, stop RERUN and use RESUME to instantly advance to the final position.

SECRET See VISIBLE.

SWITCH **This option instructs the program to switch sides in a game.** Since you can only select features when it is your move, when SWITCH is activated the computer will begin the next move immediately.

To use, select SWITCH with the cursor. Press RETURN. The **CHESS** program is now making or "thinking about" the next move.

Use SWITCH if you want to play the black pieces. Before the game starts, select SWITCH. The program will move the white pieces throughout the game, or until SWITCH is activated again.

VALUE **This feature will show you a number that represents the CHESS program's evaluation of who is winning the game, and by how much.**

This feature is not available at level Ø, and may not appear from time to time at other levels. Whenever VALUE is on the menu it is useable.

To use, select VALUE with the cursor. Press RETURN ⏎. VALUE will disappear, and a number will take its place. To return to the menu press RETURN ⏎ again.

This number can have several meanings. First of all, if the number is positive, **CHESS** thinks it is ahead in the game. Negative numbers imply that you are ahead. The larger the number (in absolute terms), the greater the advantage for one side over the other.

The following is a "rule of thumb" guide that will help you interpret the meaning of this number. A Pawn = 1; Knight = 3; Bishop = 3 and a fraction; Rook = 5; and Queen = 9. If the number shown is a fraction, it represents only a minor advantage or disadvantage and may partly be influenced by "positional" considerations.

The **VALUE** display also tells of impending checkmates. When the display reads "MT 2", this means that you will be "mated" in two moves. This is also "announced" by a message appearing on the message line.

If the display reads "–MT 2", the minus sign before the MT tells you that it is your advantage, and you have a possible mate against **CHESS** in two moves. This does not mean that you **will** win in two moves, only that you can. For this reason, **CHESS** will not "announce" future mates against itself. This information is only accessible with the VALUE feature.

Note: At those times when LOOK and ADVICE are not available, the number shown in VALUE will err in your favor. In other words, **CHESS** will be better off than the number suggests.

- The VALUE feature is not available in the MANUAL mode, or when a move(s) has been taken back. The **CHESS** program has to have evaluated a position before it can give a "value" judgment.

VISIBLE **This option allows the selection of the SECRET mode.**

When the word VISIBLE is on the menu the move that **CHESS** is considering will flash as square coordinates at the bottom of the board. This move may change as **CHESS** continues its searching. When SECRET is selected the move that the **CHESS** program is considering will **not** be shown.

SECRET is a feature designed expressly for those who desire the least distraction possible around the chessboard when concentrating on a game.

Each press of RETURN ⏎ will switch between VISIBLE and SECRET.

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Now augmented of many materiall things formerly wanting, and beautified with a three-fold Methode, viz. of the Cheſſe-men, of the Cheſſe-play, of the Cheſſe-lawes.

By Jo. Barbier. P.

Printed at London for *John Jackſon*, dwelling without Temple-Barre. 1640.

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(Noteworthy games included on the CHESS disk)

CHESS HISTORY—A Bit of Background

CHESS: A NICE AND ABSTRUSE GAME, IN WHICH TWO SETS OF MEN ARE MOVED IN OPPOSITION TO EACH OTHER. Samuel Johnson: "A Dictionary of the English Language" (1755).

The exact origins of chess are shrouded in the haze of antiquity. Theories suggesting an age of 4,000 to 5,000 years have not been in favor since the publication in 1913 of H. J. R. Murray's masterful work, "A History of Chess". The more modest dates of sixth or possibly fifth centuries, A.D., can be cited with much more certainty, and India maintains the widest support for the claim of birthplace.

Archeologists in the last decade may have found "evidence" suggesting that someone was playing chess at least as early as the 2nd century, A.D., but they have the same problems that plague most historians when written records are absent, i.e., they have to rely on interpretations of artifacts. Is a small, carved elephant an ancient chess piece, or is it . . . a small carved elephant?

As to how the game came to be . . .

One story is that a king named Balhait (the name varies), commanded a Brahman (Sissa, son of Dahir) to invent a game that would demonstrate the value of prudence, diligence, foresight, and knowledge—thereby opposing the fatalism of backgammon (!). Voila! Chess! The reward claimed by the clever, if devious, Sissa for his great service is famous in the lore of mathematics ("All I ask is for enough wheat to cover the chessboard, with one grain on the first square, two grains on the second square, four on the third square, and so on, each square in turn to have double the number of grains that are on the preceding square, until all the squares have been filled". The king foolishly agreed.).

Or, did the wife of the King of Ceylon devise the game to amuse her husband while Rama was beseiging their city? What is certain, is that the early history of chess tends to be a rich source of myth and folklore, including murders and summary executions, wealth (and wives) won and lost, and history forever changed (there is even a chess story connected with the Spanish King's approval of the fateful voyage of Columbus).

A Bit of Background

Apocryphal romances aside, the earliest known ancestor of modern chess was the Indian board game called Chaturanga, which is a Sanskrit word meaning "four limbs". This referred to the four tactical components of the typical army of ancient India, which used chariots, elephants, cavalry, and infantry, all under the auspices of the king and his minister. These symbolic pieces have evolved into Rooks, Bishops, Knights, Pawns, King and Queen, respectively. The game was played on the same size board as today, a major difference being the power of the minister (today's Queen). It was not until the late fifteenth century that the Queen was unleashed to become the most valuable component of the King's army.

The position of the pieces on the board (also unchanged), reflected actual battlefield deployment, with the speedy chariots on the flanks, and cavalry also on the flanks but closer-in, to permit fast wheeling movements; the lumbering elephants—a real power in olden times—stationed just off center; and the King and prime minister or adjutant, well protected in the important vantage point of the center.

The foot soldier composed the hard-hit front line, and usually bore the early brunt of the engagement. It is worth noting that the Latin source for the Pawn's name, "pedes" (footsoldier), can also mean "peon" (peasant/laborer), hence a dual interpretation of the pawn's identity. Until the eighteenth century, pawns "belonging to" different pieces might have different identities (a Bishop's Pawn might be a notary, a Knight's Pawn an ironworker, etc.), with each piece carved accordingly. A more recent example of the versatility of the Pawn is to be found in some Russian sets where one side portrays capitalistic Pawns bound in chains, the other side being populated by "free workers".

Returning to the sixth century—the Persians found out what the Indians were doing, and were quick to pick-up the game, introducing several variant forms as well. A version known as Timur's Chess used a board 11 squares by 10 squares, and fought battles with such pieces as giraffes, pickets, chariots, elephants, camels, "war engines", and pawns, each side also having the king, a chancellor, and a general.

A Bit of Background

"WHEN A MAN'S HOUSE IS ON FIRE, IT'S TIME TO BREAK OFF CHESS."
Thomas Fuller, 1732.

In the 7th century, the Arabs conquered chess-playing Persia, and conquered chess, becoming the greatest players of the age (despite a religious injunction forbidding the game). The Arabs were also instrumental in the spread of chess to other countries. As this dispersal progressed, the old game of the Indians continued to mutate accordingly. Board sizes ranged at least to 14 x 14 (squares), became oblong (4 x 16), round (four concentric rings, each with 16 spaces—pawns could not be promoted since there is no final square!), and the pieces were dutifully changed to whatever best suited the local culture. This opened the way for gazelles, rhinoceri, gryphons, crocodiles, lions and unicorns, the last four from medieval Spain. The Turks, in one variation, added threats such as a Police Chief and an "Armed Female Attendant".

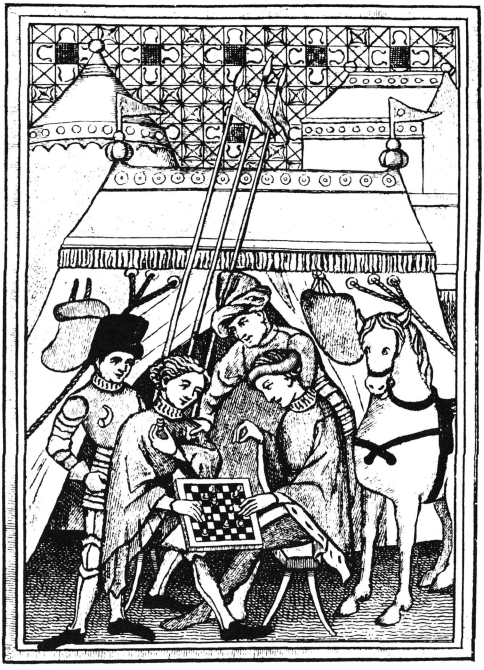
These innovations seem tame, though, when viewed from the teeming mythological jungle of Japanese chess or "Shogi". During its many centuries and change, the Japanese board has hosted Flying Chariots, Dragon Kings, Dragon Horses, Silver and Gold Generals, Spearmen, Horrible Panthers, Phoenix, Blind Tigers, Retreating Chariots, Fleeing Kings, and Straight Go-ers. Some of these pieces could be promoted (similar to modern pawn promotion), into such wonders as the Flying Stag, Flying Ox, and (one marvels at the spectacle), the Flying Pig. Shogi, incidentally, is still very much alive and well in Japan, and continues to use some of these piece designations.

Evolutionary details of the pieces we use today include: Chariot becoming a Castle (movement unchanged); Knight—always horse/cavalry (movement unchanged); Bishop—a dramatic metamorphosis from the original Elephant. The "Bishop" name is not universal, the piece being a "Fool" in France, a "Runner" in Germany, and, yes, an "Elephant" in Russia. The modern move for the Bishop was established in the late 14th century. The Queen, as mentioned earlier, evolved from a rather weak piece moving one square diagonally. The King is relatively unchanged, except regarding "castling". Castling, a special "extra" move designed to whisk His Highness to "safety", evolved from a one-time double jump allowed the King. After many variations, the present move was established in the 1600's.

Bringing the game up to the present, we have essentially come full circle, with modern day chess enthusiasts pondering a game that would be surprisingly familiar to the "Chaturanga" players of ancient India.

The Chess pieces and board have changed as the game passed through various ages and cultures, yet this fascinating game remains more than carved figures on a board. The human element has always injected a particular passion into this "Sport of Kings". From Chaucer to Shakespeare, and from Benjamin Franklin to Edgar Allan Poe, opinions of the game have echoed through the years. Con-men on the street have used "trick" chess problems to swindle the unwary. Promoters used a chess playing "automaton" to awe three generations of spectators in the 18th and 19th centuries. Heads of state have deferred important decisions in order to finish a game.

Throughout the history of chess, such anecdotes have added mystery and excitement to the popular vision of this pastime. Beginning especially with the last century, there are people who are known for nothing else but chess. With personages such as Staunton, Steinitz, Lasker, Capablanca and Morphy, up to Spassky and Fischer, chess has rarely lacked its personalities, and they all have their stories to tell. The 30,000 or so books written about the game bear abundant testimony to the ongoing preoccupation with this little board and its funny "men".



APPROACHES TO CHESS by Peter Frey

PART 1 HOW HUMANS PLAY

What does a chess master have that you and I do not have? Many people have been interested in determining the psychological attributes of a chess champion. The strong chess player is often thought of as a formidable calculating machine with incredible memory capacity. Edgar Allan Poe denigrated the game because he thought it involved boring calculations rather than creative thought. Scientists have examined these ideas in a systematic way and have discovered some unexpected answers.

Around the turn of the century, the French psychologist, Alfred Binet, the father of the IQ test, investigated the memory capacity of many of the noted chess players of his time and was surprised to find that their memory span was essentially the same as that of less skilled chess players. Several Russian psychologists examined the IQ scores of their top ranking players in the 1920's and found that the range of intelligence for this group mirrored the range of intelligence in the general population. Thus, the early systematic investigations indicated that highly skilled chess players are neither especially bright nor gifted with "photographic" memories.

A Dutch psychologist, Adrian deGroot, a skilled player himself, made a detailed study in the 1930's and 1940's of the cognitive processes involved in chess play. He traveled around Europe and across the Atlantic with most of the top players of his day. Using a battery of testing procedures, deGroot tried to discover what made the highly skilled player different from average ones. One of his tests involved complicated middle game positions which the chess players studied and then selected the best move. deGroot had his subjects report their thoughts as they worked on these problems. He carefully recorded each verbal protocol and later made a systematic analysis of each player's thinking process. After several years of data collection, deGroot summarized his findings by presenting average values for several important measures. Top players and average players were very similar in the quantitative aspects of their chess thinking. They considered a similar number of future positions (about 35), had equivalent depths of maximum look-ahead (about 6 and 1/2 plies), looked at an equal number of moves at the first level (about 4), and made the same number of fresh starts (about 3). The top players were not considering hundreds of positions nor were they doing more or deeper analysis than the average player. The only clear difference seemed to be their choice of what to analyze and their final move selection.

deGroot noted that all of his subjects were silent just after a new position was presented, and no matter how much he urged them to talk, this pause occurred. He surmised that some important nonverbal process was taking place when the player first began his analysis. Later research confirmed this hypothesis. A Russian experiment demonstrated by eye movement analysis that subjects made a global visual inspection of the position when it was first presented. This perceptual processing was apparently the crucial point where the strong and average players began to diverge. Subsequent research by deGroot indicated that strong players can remember the location of almost all the pieces when they are briefly shown a complicated middle game position while average players remember far less. This advantage disappears if the pieces are randomly placed on the board. The superior memory is therefore chess specific. The most plausible interpretation of this finding is that experienced chess players develop special perceptual skills such that they "see" chess pieces in meaningful patterns. In the memory task, they remember 6 or 7 piece **groupings** while inexperienced players remember 6 or 7 **pieces**. Subsequent research in this country has confirmed this interpretation.

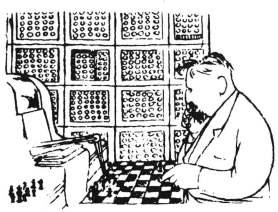
The current theory of chess skill is that players develop, through years of practice, a very specific set of perceptual skills in which chess pieces are perceived in meaningful patterns rather than as individual pieces, and they also learn what to do with these patterns to produce winning chess positions. Learning to play chess is like learning to read. For the child, writing consists of many unfamiliar letters mixed in confusing patterns all over the page. For an experienced reader, however, the letters are almost unnoticed. Instead, the page is perceived in terms of words and phrases, with the latter part of each sentence processed only briefly, because the reader had anticipated the general idea in advance from the context of the passage. Research indicates that a very similar process occurs in chess. The experienced player sees a familiar terrain populated by frequently encountered piece groupings. He knows what the patterns connote and what is required for skillful play. Chess skill is a perceptual skill, not a process of computation. Careful move-by-move analysis is used only as a confirmation that the opponent does not have a tactical shot which might refute the intended line of play.

PART 2 HOW COMPUTERS PLAY

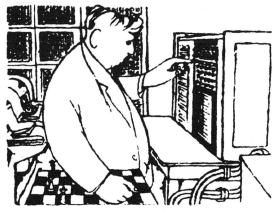
A computer is a general purpose machine which can manipulate numbers and symbols under the control of various sets of instructions. When computers were first designed they were used to calculate artillery trajectories and for similar military purposes. It was not long, however, before many peace-time uses were developed, including applications in banking, accounting, and bookkeeping. Very few people, however, envisioned that a computer could be more than a fancy calculator. Even fewer people would have taken you seriously if you had suggested that a computer could play a decent game of chess. Much has changed since those early days, and computers are now seen as a powerful tool for aiding humans in complex decision-making tasks. In future years, computer systems may be developed which are sufficiently reliable and "intelligent" to take on important high level roles. Current research on computer chess provides a challenging laboratory for serious work on these developments.

It is not easy to program a computer to play chess. Over the past several decades, techniques have been developed through thoughtful, painstaking effort which have proven to be valuable. Almost all of the modern chess programs are variations on a single theme. The computer represents the playing board as an 8 by 8 array of numbers and represents the pieces by assigning a positive or negative digit to each type of piece. Legal moves can be generated by using a special set of instructions for each piece, which examines the current state of the board and applies appropriate offsets to determine the potential move squares. The details of these procedures vary from one program to another and are often tailored to the special characteristics of each machine to maximize efficiency.

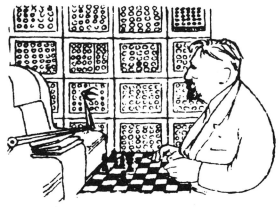
Move selection involves three major modules. One module generates a look-ahead tree of possible continuations. In most programs, the look-ahead process is exhaustive. That is, all moves are considered at the first level; every possible reply to each of these is then considered; every counter-reply is examined, etc. The number of end points grows exponentially as the depth of the search process increases. For this reason, chess programs, even on huge, million dollar machines, can look ahead only a limited distance. When a computer misses an important continuation in its move planning process, programmers describe the difficulty as a "horizon effect". Chess programs consider each continuation as far as is practical in the allotted time and then assign a numerical value to each end position by using the second and third modules.



'Don't be so sure of yourself!'



... I can always push a button...



... and you will lose. ("Świat").

The second module is called the evaluation function. It applies simple chess ideas to analyze specific board positions. Thus, it considers the relative material for the two sides, their relative mobility, control of the central squares, king safety, pawn structure, etc. and then assigns a value to that position. The more sophisticated the evaluation function is in terms of chess knowledge, the greater the amount of processing time which is required for each end position in the look-ahead search. Therefore, a clear trade-off exists between the number of positions examined and the complexity of the evaluation process.

The third module is called the quiescence function. It considers each end position to determine whether additional captures or checking moves might dramatically influence the evaluation. It uses a complex capture analysis or does further searching to insure that the value assigned is accurate, since it would be foolish to examine a position and assign a value without taking into consideration that the opponent can capture your queen on the very next move. The evaluation function and the quiescence function require efficient program code, since they are executed millions of times during a game. In addition, these two modules are the real "brains" of the program and therefore reflect the programmer's chess sophistication.

The final decision on which move to make is based on an important theoretical idea developed in the 1940's—the minimax strategy. In essence, the programs choose that move which minimizes the opponent's maximum potential gain. In practical terms, the machine assumes that each player will select the move at each choice point which maximizes his value at the end points. This is determined by taking the values at each end point and "backing them up" the look-ahead tree. If positive values are good for the machine and negative values are good for the opponent (the usual convention), the machine selects the pathway at even-ply choice points (the opponent's turn) which leads to the minimum valued end point, while selecting at odd-ply choice points (the machine's turn) the pathway that leads to the maximum valued end point. By successively maximizing and minimizing, the machine can pick a set of future moves which represents best play for both sides and then choose its initial move accordingly.

Over the years, the process described above has been refined in many ways, especially in terms of how efficiently the computer conducts the search process. Experienced chess programmers talk about the alpha-beta algorithm, the killer heuristic, the importance of searching captures first, the iterative search, transposition tables, and many other techniques for improving their programs. To learn about these, however, you will need to visit your bookstore and obtain one of the books that are now available on computer chess. If you come to enjoy your contests against the computer, as we expect you will, a bit of reading about your computer opponent may be fun and rewarding. If you learn more about how the machine thinks, you may be able to use this knowledge against it. Happy hunting.

A LOOK AT CHESS STRATEGY By Peter Frey

Editorial Introduction

Chess is a complex game that has been studied seriously for years. A large library could be filled with all the books which have been written on the subject. If you are an experienced player, you know that a few pages cannot encompass the subtleties of the game. However, you may find that this section will summarize and focus some of the tactical and strategic principles you have already explored.

If you are a beginner, it should be said that the basics of this challenging game are best learned through guided trial and error, with the aid of a knowledgeable and understanding tutor.

Your **CHESS** program's role in this process can be as large as you wish to make it. **CHESS** will never get impatient, and will bear all your "questions" without irritation. Your available moves will be shown for each play, and advice often offered. As you progress, you will begin to get a "feel for the board" and will find the following pages holding more and more meaning. In the final analysis, of course, only your own interest and application will determine how deeply you wish to delve.

A chess game, like a classical sonata, is divided into movements. Unlike musical composition, however, the movements of a chess game are not clearly defined; they merge gradually and imperceptibly into one another. The first movement is the opening. During this part of the game, each player attempts to develop his or her pawns and pieces to positions from which they can exert their powers. The groundwork is laid for battles which are soon to follow. The kings are usually moved to a safe location, most commonly by castling. The **middle game** follows, and each side tries to gain an advantage, either by winning material or by gaining a positional edge, such as creating a passed pawn or an open file which can be controlled, or weakening the defensive position of the opponent's king. When most of the pieces have been removed from the board by capture, the game enters the final phase—the **endgame.** This is the most demanding part of the game. The logic of play must be exact; without precise technique, a solid lead can slip away. Strong players spend years of study to become proficient in endgame play.

Many games, especially those between two amateurs, are decided by material force. If one player gains an edge in material, such as having one more piece than his opponent, this advantage alone is enough to win. Therefore, it is essential to avoid losing material when no positional compensation is involved. It is traditional to assign relative values to the chess pieces. A queen is valued as 9 pawns; a rook as 5 pawns; a bishop and a knight are each valued as 3 pawns. The value of these latter two pieces depends heavily on the actual board position. Knights are especially useful in a closed position (one involving many locked pawns) and when situated on a centrally located square. Bishops are more valuable in an open position since they can strike at a distance. A bishop pair is worth more than twice a single bishop. The rook's value also depends on situational factors. Two rooks are worth more than twice a single rook, especially when they are positioned to defend each other (called doubled rooks). A rook on the seventh rank (the initial row for the opponent's pawns) is very powerful because it can attack enemy pawns and restrict the enemy king to the back rank.

Chess strategy also involves important positional principles. A chess board is a battlefield, and a successful commander will try to control influential territory. The "high ground" in chess includes the central squares of the board and the squares immediately surrounding the two kings. When material is even, territorial control becomes very important. Accordingly, it is common to place minor pieces in such a way that they attack the squares in the middle of the board or squares adjacent to the enemy king. Rooks are often placed on an open file (one without any pawns) so that they exercise maximum space control. An interesting factor in territorial control is that the degree of influence is inversely correlated with the importance of the piece. Therefore, a pawn exerts the greatest amount of control on a square. The queen exerts the least control. The reason for this is that the queen can be attacked and easily dislodged; the pawn is more dispensable and thus cannot easily be chased away.

Another important general principle is that of mobility. Mobility can be defined as the number of legal moves available at any given time. If one side has an advantage in mobility this can often be converted into a plan for gaining material or launching a successful attack on the opponent's king. Note that the bishop, rook, and queen on their original squares have no legal moves. An opening move such as e2-e4 (pawn to K4) is good not only because the pawn in its new position controls an important central square, but also because the queen and bishop can now escape from the back rank. In fact, this common opening move for White increases his mobility by 10 moves (5 for the king's bishop, 4 for the queen, and 1 for the king). Beginning players are often advised to develop their knights to interior squares rather than edge squares. This is consistent with the mobility principle. A knight can move to eight squares from a central square but only four or fewer squares from an edge square.

There are also important principles related to the king's position. During the early and middle stages of the game, it is important to keep the king out of harm's way. For this reason, opening strategy favors moves which prepare castling. Thus, 1. e2-e4 is also good for White because it prepares space to move the king's bishop, which is a prerequisite for castling on the king side. Another aspect of protecting the king involves the pawns immediately adjacent to the king. It is common to maintain the three king-side pawns (bishop pawn, knight pawn, and rook pawn) on their original squares in order to provide a protective shield for the king after it has castled. After heavy battles have been fought and the major pieces have been removed from the field of play, the king becomes an important offensive piece and generally moves out of its defensive position to aid its pawns and minor pieces. Knowing when to activate the king is a difficult decision which takes very keen judgment.

The most sophisticated knowledge of the opening and middle phases of a chess game is required for making pawn moves correctly. Placement of the lowly pawns usually determines the character of the game. Pawn moves are irreversible and therefore should be made only after careful deliberation. An ill-advised piece move can always be retracted (if there is time), but pawn moves are forever. Because the pawns are the most powerful tools for controlling important squares, their placement has a tremendous impact on the game. In general, central pawns are advanced first; the purpose is to control central squares and to make room for moving the queen and bishops off of the back rank. The three pawns on the king side are often not moved, with the idea that castling will occur to that side. In pawn exchanges, players try to avoid positions which have doubled pawns (two pawns on the same file) and seek positions with a passed pawn (a pawn which has no opponent pawns on the same file and adjacent files). It is also advisable to avoid backward pawns. A backward pawn is one which is blocked from advancing by an opposing pawn or piece and which has no friendly pawns in proximity on adjacent files. An isolated, backward pawn is the worst case. Not only does it not have any pawn allies, but it has no hope of ever gaining any. Isolated pawns, backward pawns, and doubled pawns often become targets for an opponent's attack. A properly placed pawn majority on one side of the board can provide a decisive advantage in the endgame. When played properly, this advantage almost always leads to a pawn promotion and victory.

The opening moves in chess have been analyzed carefully for centuries. Opening variations have been tested and refined for many years, and there are hundreds of books which provide detailed knowledge for this phase of the game. It is essential for a championship level player to know many different variations in exact form. For the amateur, however, it is enough to know a few variations in general form and to know a few principles which help to guide the opening moves. There are a few classical ideas that all players should know:

1. The two central pawns (king and queen pawns) should be moved before the other pawns. It is often best not to move the other pawns at all during the opening.
2. Develop the minor pieces (knight and bishop) before the major pieces (rook and queen). Develop both knights before developing the queen bishop. If the major pieces are developed early, they can be attacked and dislodged by the opponent with developing moves of his own. Since the opening is a race to see who can get their troops deployed first, one should avoid moving the same piece twice during the opening.
3. Make moves which prepare castling, and castle early. Many games are lost because the king is caught in the middle of the board with no place to hide.
4. Develop a general plan and follow it. The most common strategy is to place your pieces such that they control the central territory or attack the opponent's king position. Strive to prevent your opponent from gaining control of the center.
5. Deploy your forces carefully before attempting to launch an attack on your opponent. Try to mount tactical threats or meet your opponent's threats with moves that develop a piece or pawn to a desirable square. Place a high priority on moving your pieces off of the back rank as soon as is practical. Many strong players will ignore an opponent's threat to capture a pawn and continue to develop their pieces. If the opponent takes the time to capture, he may fall helplessly behind in development and later pay a high price for his impatient greed.

In the middle game, each player maneuvers to gain an advantage. The most obvious way to do this is to win material. Probably the most commonly used weapon to win material is the pin, a simple and wonderfully effective device. A pin is created by using a long distance piece (a bishop, rook, or queen) to attack an opponent's piece which is located on the same attack line as a second enemy piece (usually a more valuable one) such that your attacking piece would attack the second piece if the first one were moved. When the second piece is the enemy king, your opponent cannot legally move the attacked piece. It is essentially frozen in place. When the second piece is an important one such as the queen or a rook, your opponent usually cannot move the attacked piece for fear of losing the queen or rook. It is a common and effective strategy to pin a piece and then attack it a second time with a pawn or minor piece. Since it cannot move, the only recourse is to provide defenders. However, if one of the attackers is less valuable than the attacked piece, the situation becomes hopeless for the defender. A pin can be a powerful weapon, not only for winning material directly, but for immobilizing an attacker or defender that might otherwise be a serious problem. Experienced players are always watchful for the opportunity to execute a pin.

Another middle game tactical weapon which is very effective is the fork or double attack. A fork can be executed by a pawn, a knight, a bishop, a rook, or a queen. The idea is a simple one. The player moves a piece or pawn to a square where it simultaneously attacks two or more enemy pieces. Since the opponent cannot move more than one piece on his next turn, the attack usually creates serious problems for the opponent. If the attacked pieces are undefended, one will almost always be lost. If both pieces are defended, the assault can still be effective if the attacking piece is of lesser value than those being attacked. Examples include a pawn attacking two rooks or a bishop attacking a rook and a queen. Knight forks can be especially effective. A common trick is to move the knight so that it simultaneously attacks both the king and queen or the king and a rook. In these instances, the opponent usually has no defense and suffers a major setback. Many a promising game has been lost by a player who overlooked a devastating fork.

Another powerful tactical weapon for middle game play is the discovered attack. This device is always a delight to beginners because of its element of surprise. The discovered attack is set up by interposing a minor piece, often a knight, in the attack line of a long distance piece. When the player moves his knight, the attack of the second piece also becomes effective. If the knight's new location also creates an attacking threat, the player has produced two new attacks by making a single move. The discovered attack can be used as part of a tactical winning combination to gain material or in more subtle ways. An example of this latter application would be, as a ploy, to move the knight to an attacked square where it normally could not move without being taken. However, the discovered attack forces the opponent to move or defend the attacked piece, and in doing this gives the player an opportunity to move the knight out of danger. This trick might be used to move the knight to a desirable square that it might not otherwise be able to get to.

There are also other useful tactical ideas which are very effective in the middle game. Two tricks which are closely related involve taking advantage of an overworked defender and taking advantage of a vulnerable defender. In the first case, a player may notice that a single piece is defending two or more other pieces. If one of these is taken and the opponent recaptures, the other pieces or pieces which were previously defended are now en prise (open to capture without compensation). The second case involves an enemy piece which plays a crucial role in the opponent's defense. The idea is to attack the defender and capture it even if the exchange loses material because in doing so, the primary target suddenly becomes vulnerable. This tactic is a common way to weaken what would otherwise be an impenetrable defense. A related idea is the notion of false protection. The opponent may have an important attacking piece which is defended by one of his pawns or minor pieces. A useful way to circumvent his protection for this piece is to pin the defender against the enemy king or enemy queen. In this case, the protection becomes false; the defending piece can no longer recapture.

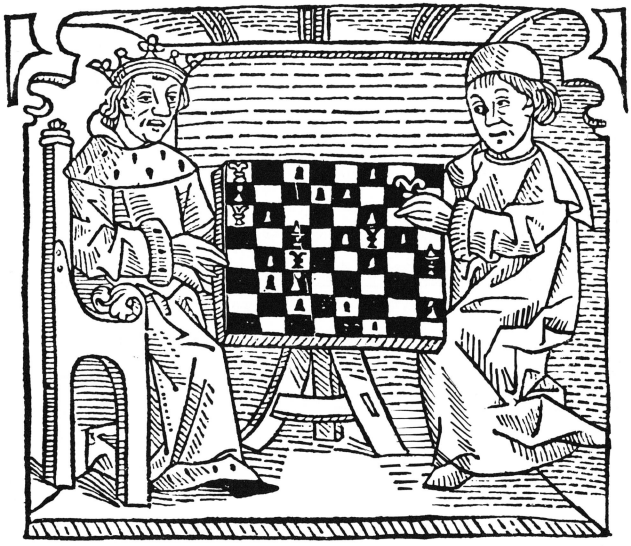
If the two players are fairly evenly matched, the contest may progress to the point where the major pieces have been exchanged and the opposing forces consist of pawns, kings, and a few minor pieces. If the material situation is even or differs only by one pawn, the outcome will depend on the players' endgame skill. This scenario is very common for contests between experienced players. In the endgame, the king ventures forth and becomes an aggressive, fighting piece. The pawns become the central focus of attention. A single strategic idea becomes dominant: create a passed pawn and advance it to the eight rank where it can be promoted to a queen (or occasionally to a lesser piece). Pawn promotion usually brings a swift end to the hard fought battle. Knowing when to activate the king, when to advance the pawns, and which pawn should lead are all difficult decisions. The endgame also requires careful cooperation between the king, the pawns, and a minor piece or two. The difference between a good player and a master usually lies in their knowledge of how to play specialized endgame positions. This knowledge is crucial, since a player makes decisions in the middle game which have a decisive effect on his winning chances in the endgame. An experienced player will create exchanges in the middle game which lead to endgame positions with a winning advantage. The less experienced player may fight to equalize material and only later discover that the seemingly close game is hopelessly lost.

One cannot expect to play the endgame well by relying on general principles. Specialized knowledge is essential. Given this limitation, however, the beginner must necessarily start somewhere and, in this case, somewhere means a few important general principles. In the late middle game, each player should strive to create a passed pawn (one that is not blocked or attackable by an enemy pawn) or a pawn majority (4 pawns opposed by 3 or 3 pawns opposed by 2). If one side has a **material** advantage, such as an extra piece or a rook offset by a knight or a bishop, the player with the material advantage should strive to trade pieces but not pawns. When the endgame begins (and this is often difficult to judge), the player should promptly activate his king to support his passed pawn or pawn majority. Timing is crucial, since both sides may have winning chances. The contest becomes a race to see who can promote first. The player who is first to activate his pawns will force the other player to defend rather than to exercise his promotion chances. A player can often determine if a passed pawn can advance and queen by simply counting squares. When both sides are pushing pawns, however, and tactical skirmishes are involved, there is no substitute for precise calculation. It is this characteristic which makes endgame play so demanding and why it separates the truly skilled player from an average one.

A Look At Chess Strategy

Another important part of endgame play can be learned much more easily: how to finish a game efficiently once you have gained a clear material advantage. There are well-known techniques for producing a mate when a king and rook oppose a lone king or when a queen and rook oppose a lone king. With proper play by the defender, a king and knight cannot mate a lone king. Nor can a king and bishop. A king, knight, and bishop can mate a lone king, but the procedure is tricky and not easily done. A queen and king against a rook and king is technically a win, but with proper play the defender can make the job a very difficult one. Good players read appropriate books on these endings and learn the proper methods. Most books for beginners on how to play chess cover these situations in some detail.

These are a few of the basic ideas on how to play chess. The enthusiastic beginner should visit his local bookstore or library for a few books on chess technique. Also, you have a willing opponent and tutor in chess. If you fall into a simple trap, simply take back the offending move, chalk up one to experience so you avoid such mistakes in the future, and continue play with a better move. The special advantage of a computer opponent is that nobody else has to know that you made six blunders that were taken back on the way to your ultimate victory.



These games represent a small selection of interesting encounters that are notable because of either **who** played them, **when** they were played, or **how** they were played. A few are slipped in just because they are clever.

✔To access these games, the **DRIVE** option must be set to "1". Then, keeping the **CHESS** disk in place, select **GET**. Press RETURN ⓞ. The **CHESS** catalog of games will appear. Refer to the game numbers for the least confusion during selection.

• These games have been saved in the starting position. Use **REPLAY** to step through a game. Analyze the position and see if you can arrive at the next move. To see the moves made automatically, use **RERUN**.

• **IN THE FOLLOWING NOTES, THE FIRST NAME LISTED IS ALWAYS THE PLAYER OF THE WHITE PIECES.**

1. Fool's Mate. The shortest possible game ending in checkmate. This combination has been known for many centuries (published as early as the 1600's).
2. Scholar's Mate. A mate in four moves. Its history approximates the Fool's Mate.
3. Gioachino Greco vs. Amateur, Rome, 1619. Greco was a top player in 17th century Italy.
4. De Legal vs. Saint Brie, Paris, 1750. Legal was the instructor of Philidore. The particular combination of moves leading up to the mate in this game has come to be known as "Legal's Mate". Watch for Legal's surprise move after move 4 by black.
5. Captain Smith vs. Francois Andre Danican Philidore, London, 1790. Philidore is considered by many to be the greatest player of his era.
6. Kennedy vs. Amateur, Brighton, 1845. Kennedy gives odds of a Knight. Wins in seven moves. This game is demonstrated in the **DEMO**.
7. Taylor vs. Amateur, London, 1862. After Black's fifth move, Taylor announces a "mate in 8". The helpless Black king is then pushed and shoved clear across the board.
8. Meeks vs. Amateur, New Orleans, 1855. Move 7 is a killer!
9. Paul Charles Morphy vs. Brunswick Isouard, Paris, 1858. This famous game demonstrates many basic principles in a masterful style. To fully appreciate the beauty of this game, you should step through move-by-move. During his brief chess career (1857–1859), Morphy reigned supreme, defeating all of the top players who dared to accept his challenge.
10. Wilhelm Steinitz vs. Mikhail Ivanovich Tchigorin, Havana, 1892. Black resigned after White's 28th move (mate is one move away). Steinitz is generally considered to have been the world's strongest player for the period from 1872–1894. Tchigorin is thought of as the founder of the Soviet school of chess. He challenged Steinitz twice for the World Championship, but to no avail.
11. Pillsbury vs. Emanuel Lasker, St. Petersburg, 1895–6. White resigned after Black's 28th move. Black can mate in four (as illustrated here). Emanuel Lasker was the World Champion from 1894 to 1921.
12. Harry Nelson Pillsbury vs. Fernandez, Havana, 1900. This is one of 12 simultaneous games played blindfolded by Pillsbury, who was a master of tremendous feats of memory and concentration. He was also plagued by illness, and died six years after this exhibition at the age of 34. Pillsbury rocked the chess world in 1895 with a stunning victory at the Hastings tournament in England, where he decisively defeated some of the world's best players. His physical problems began during the St. Petersburg tournament, where he had led during the first half, and then began to deteriorate.

13. Rotlewi vs. Akiba Rubinstein, Lodz, 1907. White resigns after Black's 25th move. Rubinstein was one of the world's strongest players during the decade before World War I. In the play of the endgame, he had no peer. This game against Rotlewi is his most famous.
14. Muhlock vs. Kostics, Cologne, 1912. Watch-out for early traps!
15. Mlotkowski vs. Deacon, Philadelphia, 1913. Another example of blindfold play. The "sightless" Mlotkowski administers mate with a Pawn.
16. Frank James Marshall vs. Bogoljubov, New York, 1924. After making move 38, White announced mate in five. Marshall was one of the first International Grandmasters, "crowned" as such by Czar Nicholas in 1914.
17. Jose Raul Capablanca y Graupera vs. Amateur, New York, 1918. This game may not be the best example of the brilliance of this great Master, but who better than Capablanca can demonstrate that imitation is no substitute for skill. This poor amateur learned the hard way. Capablanca was World Champion for six years in the 1920's. He is thought of by many as the most gifted chess player ever.
18. Alexander Alekhine vs. Frederick Dewhurst Yates, Carlsbad, 1923. After Black's 50th move, White resigned (mate in two). Alekhine, although shown losing here, was the World Champion for a total of 17 years (not all consecutive), beginning in 1927. Yates was six-times British Champion, and is noted for his victories over the best players of the day. This game is a prime example, with an 18-move combination leading to the win.
19. Ernst Grunfeld vs. Ewfim Dmitrievich Bogoljubov, Vienna, 1922. Although Bogoljubov is represented in this collection with two losing games, he was a top player in the 1920's, and was thwarted from achieving the World Champion title only by Alekhine. Grunfeld was a strong player in the 1920's and '30's, but for the most part is remembered as a chess writer and theoretician.
20. Gibaud vs. Lazard, Paris, 1924. The shortest tournament game played between Masters. After move four by black, white resigned.
21. Ruebin Fine vs. Herman Helms, New York, 1945. This is one of two games played blindfolded, simultaneously, and with only 10 seconds allowed for each move! Fine was often the winner of the U.S. Open (chess) Championship in the 1930's, and has written numerous useful books. Helms, an amateur player, published the American Chess Bulletin.
22. Edward Lasker vs. Israel Albert Horowitz, New York, 1946. Games between Masters are not always this short. Horowitz won two U.S. Open Championships, and founded the magazine "Chess Review". Edward Lasker's long involvement with chess was highlighted by numerous Championship wins in the years between 1909 and 1921 (Berlin, London, New York, etc.).
23. Miguel Najdorf vs. (a consulting team), Sao Paulo, 1947. This is a final example of blindfold play, and what an example! The game shown is one of 45 simultaneous games played completely by memory (winning 39, drawing 4, and losing only 2). In this particular game, after Black's 20th move, Najdorf announced a "mate in six" (and without even peeking). Najdorf has won the title "Champion of Argentina" a number of times over the past 30+ years.
24. Donald Byrne vs. Robert J. Fischer, New Yrok, 1956. This game, referred to by some as "the game of the century", marked the beginning of the rapid ascent of the then 13-year-old Bobby Fischer.
25. Fischer vs. Boris Spassky, Reykjavik, 1972. Game six. After White's 41st move, Black resigned. For the purpose of illustration, the game is "continued" here to show the winning threat. After various disputes and delays, Fischer eventually won the tournament, and assumed the World Champion title which he held until 1975. Fischer has been compared with Capablanca because of his "gifted" play of the game. He was the youngest Grand Master in the history of the title.

Games Between Computers
For the curious, here are a few games played during various Championship tournaments. The computers used range from "mini"'s to "main frame"'s and beyond. The names are those given to the various programs.

26. Blitz vs. Belle, Washington, D.C., 1978. This game is considered one of the best to be played by a machine. Blitz: Robert Hyatt & Albert Gower for the University of Southern Mississippi. Belle: Ken Thompson & Joe Condon for Bell Labs, Murray Hill. N.J.
27. Chess 4.9 vs. Duchess, Detroit, Michigan, 1979. This game shows some nice combinations and a temporary piece sacrifice. Chess 4.9: David Slate & Larry Atkin for the Northwestern University, Evanston, Ill. Duchess: Tom Truscott, Bruce Wright, & Eric Jensen for Duke University, Durham, N.C.
28. Nuchess vs. Belle, Linz, Austria, 1979. This was a wide-open game, with many opportunities for both sides (ended in a draw). Nuchess is a re-write of the Northwestern program (represented as 4.9 in game 27): David Slate & William Blanchard for Northwestern University.
29. Kaissa vs. The Ostrich, Stockholm, Sweden, 1974. Ostrich was ahead in this game, then misses a continuing opportunity to mate (rook takes pawn, beginning with move 35). Kaissa: V.L. Arlazaroff, M.V. Donskoy, G.M. Adelson-Velskii, A.R. Bitman, and others, for the Institute For System Studies, Moscow, U.S.S.R. Ostrich: George Arnold & Monty Newborn for Columbia University, N.Y.
30. Belle vs. Chaos, Linz, Austria, 1980. The most exciting game of the tournament. Chaos: Fred Swartz, Mike Alexander, Jack O'Keefe, & Victor Berman, for the University of Michigan, Ann Arbor.

Games Between Humans and Computers
Although chess programs have not yet displaced Grand Masters, here are a couple of examples of winning play against humans.

31. Walter S. Browne vs. "Chess 4.6", Minnesota Chess Association, 1978. Here is a good example of a chess program pushing a slight advantage to eventually win. This was one game in a 44-game exhibition by the Grand Master Browne.
32. "Belle" vs. Gibson, Carnegie Mellon Univ., 1980. An example of good positional manueuvering by a computer.

A Few "Problems". Chess problems have teased the brains of enthusiasts for centuries. A common type of problem involves setting up a special position on the board, and then challenging others to find the correct first move that will result in a checkmate in two or three moves. Another type of problem is one where the position to be studied arose during an actual game. These are not the only types of chess problems, but these are the styles that have been selected for inclusion here.

The problems given here are stored as board positions. After loading your selection into the computer, study the displayed position. When you think you have solved it (or give-up), select REPLAY (and press RETURN ⏎). This will give the one-move "solution". From there, you may try any combination of moves to check out its "validity".

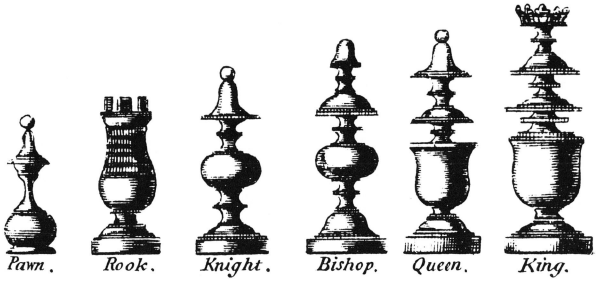
33. White to play, mates in two moves. A. Ellerman, 1925. This is considered one of the best examples of this sort of problem ever devised. After White makes the correct first move, Black has a seemingly endless array of counter-moves. None prevent mate in the next move.

• After using REPLAY to see White's move, set the skill level to 4. You may now go to the board and try-out any move for Black. **CHESS** will respond with the correct mating move.

34. White to play, mates in two. A.J. Fink and J.F. Stimson, 1920. Another great problem where once the correct first move is made, Black has many replies, all of which are futile.
35. White to play, mates in two.
36. White to play, mates in two.
37. White to play, mates in three.
38. White to play, mates in three.
39. White to play, mates in four.
40. Black to play, mates in nine. The entire sequence is available for recall.

NOTES ON SOURCES
There are many great players and noteable games that are not represented here. To learn about them, and for much more information about the games that are listed here, you have a wide choice of books from which to choose.

Some of the specific books that have been helpful to the writer during the preparation of this manual are:
(Games)
Chernev, Irving—The 1000 Best Short Games of Chess.
Fine, Reuben—The World's Great Chess Games.
Korn, Walter—America's Chess Heritage.
(General Reference)
Brace, Edward R.—An Illustrated Dictionary of Chess.
Murray, H.J.R.—A History of Chess.
Sunnucks, Anne—The Encyclopaedia of Chess.



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